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DEATH OF MR. C. V. SMITH.

The fateful heading to these few words will convey to the fraternity the painful news that Mr. C. V. Smith, Chief Engineer to the Manhattan Gas Light Company, of New York city, and a bright and honored member of our profession, has been taken from the ranks. The ominous message came without warning—for not even his closest relatives had any suspicion that the end was so near at hand. In our issue of June 2d the welcome information was vouchsafed that Mr. Smith had arrived in New York city, per steamship Aurania, on May 26th, and that his trip to Europe had been beneficial to a marked degree. Such was the opinion of all who had seen him since his return, and it is this that makes the last distressing information the harder to bear. His demise occurred at three o'clock on the morning of June 30th, and is attributed by the attending physicians to disease of the heart. The funeral services will be held on Thursday, July 3d.

THE TRUTH ABOUT THE WATER GAS MATTER IN WASHINGTON D. C.

The firm of Messrs A. O. Granger & Company has long been recognized by the gas men of this country as a concern possessed of a wonderfully fecund imagination, and it is equally well-known that the same business partnership has never shown a disposition to "hide its light under a bushel." Imagination is certainly an excellent gift of the mind; and, moreover, is particularly well-adapted as an adjunct in the matter of disposing of patent rights, provided that the aforesaid excellent gift be handled with sufficient reserve and not allowed to overstep the bounds of prudence. Still, notwithstanding all that may justly be spoken in commendation of the virtues of imagination, it is one closely allied to danger, for the space separating it from boasting is but narrow, and narrow ditches are easily bridged. If the proper cultivation and use of imagination be meritorious and admirable, the same cannot be truthfully said of that particular state of affairs where real simon pure imagination ends and boastfulness begins.

The anxious and perturbed inventor, who thinks he has solved the questions that have been perplexing his brain from the moment his attorney imparts the information that the patent office has decided to issue the sought for stamp of originality and protection, may be partially excused for indulging in an outbreak of harmless exultation and vainglorious enthusiasm on the ground that he sees before him the creation of his fancy, the child of his labor, the representative of months, perhaps years, of mental activity, alternating between the depressing chill of waning hope and again warmed into the ardent fire of assured success, actually wrapped up, and jauntily descending the steps of the Patent Office, in all the gorgeous raiment of Letters Patent, Number XYZ. Having pardoned the first ebullitions of enthusiasm, we now naturally expect our inventor will settle down to the sad and sober reality of trying to convince others that the "boon which he has conferred upon mankind" is really one of the solid kind, and destined not only to relieve a "long-felt want" but also to "put money in the purse" of the capitalist—that necessary spoke in the wheel of the inventor—who undertakes to furnish the "sinews of war." This much settled to the satisfaction of all concerned, we certainly shall require of our inventor that he now adheres strictly to the truth of all his after-statements; and if we find him trying to convey the impression that Mr. Smithers, who has already set

up three sets of the "improved XYZ methods for compressing wind, has decided to add three more sets of the apparatus, with a slight improvement in the style of construction discovered since the original system was concocted, whereby the wind compression is accomplished at greatly decreased cost," and when, upon investigation, this is discovered not to be exactly the case, why the natural inference is that our patentee is drawing too largely upon his imagination, and that he has bridged the narrow ditch leading into the land of boasting.

When Mr. George A. McIlhenny, holding the responsible positions of President and Engineer to the Washington (D. C.) Gas Light Company, decided to make some practical experiments in regard to the manufacture of water gas, and called upon Messrs. A. O. Granger & Company to erect a certain capacity of water gas plant at his works, the fact was heralded about in gas circles throughout the country as a very significant state of affairs. It was quietly offered as evidence of the conversion to water gas ideas of one of the most talented gas engineers in the United States. Undoubtedly this would have been true, had the case been as represented, without the intervention of any distortion of its salient features; and the eager horde of water gas speculators would be placed in possession of an argument that would be hard to answer. Knowing Mr. McIlhenny as we do, and confident, as we equally are, that he would take no hasty steps in dealing with a subject of such a nature, and being thoroughly cognizant of the sure defeat of the people who were so anxious to plunder the Washington Gas Light Company, it was hard to reconcile all these things so as to merge them in consonance with the claims so roundly asserted as true; and now we have the satisfaction of positively denying the authenticity of the latest statements made by Granger & Company, in a circular letter recently published by them, concerning an "additional" order for *more* water gas plant for the Washington Company. The denial is made in the shape of the reproduction of the following letter, which needs no further comment:

"ENGINEER'S OFFICE, GAS WORKS FOOT OF G STREET,
WASHINGTON, D. C., June 24, 1884.

"JOS. R. THOMAS, ESQ., Editor AMERICAN GAS LIGHT JOURNAL:

"Dear Sir: Your letter of the 23d inst., enclosing circular of Messrs A. O. Granger & Company publishing an acceptance of their offer to construct two additional sets of their water gas machines, and asking me if we intended abandoning in future the manufacture of gas from coal, and making our supply exclusively from oil and steam, is just this moment at hand. In reply will state that the order given Messrs. A. O. Granger & Company, for two additional sets of their water gas machines, is not because we intend making less coal gas than heretofore, nor from any change of views on this subject, but simply because we found from experience, in order to use continuously the four sets that we have, it is necessary to have a reserve, or extra, set.

"Another reason is that Messrs. A. O. Granger & Company claim that they can, with their improved apparatus, make much better results than we have been able to make with our present plant; and, as we are extremely anxious to secure the best return, we thought it wise to give them the opportunity to make the promised improved results. Yours very truly,

"GEO. A. MCILHENNY, President and Engineer."

Delta's Criticism on Mr. Somerville's Paper.

Mr. James Somerville, Engineer and Superintendent of the Indianapolis (Ind.) Gas Light and Coke Coke Company, communicates the following in relation to the article signed 'Delta,' published in the last issue of the JOURNAL. Mr. Somerville says:

"I have to thank 'Delta' for his courteous criticism on my paper. The points he makes are good ones. It certainly looks as if I ought to be able to produce a much larger amount of sulphate from 72 gallons of 8-ounce liquor than I do; but I think a satisfactory explanation can be made. I test the liquor with a Twaddle hydrometer, which instrument, no doubt, gives me the specific gravity correctly enough; but it does not by any means indicate the amount of ammonia contained in the liquor.

"I am satisfied, from the action of the purifiers, that I am removing, by the agency of the ammonia scrubber, a large portion of SH_2 and CO_2; and it is the presence of these impurities in the liquor which gives it its apparent strength. The distillation test used by Mr. Hyde, of Cleveland, is the only correct method of ascertaining the amount of ammonia in the liquor.

"'Delta' wishes me to correct an assertion that I did not make. I stated that free ammonia had no power to absorb SH_2 or CO_2 (which is perfectly true) but not so in the presence of H_2O—the case is entirely altered then—for the ammonia will not, or ought not, to be any longer free, but will combine with H_2O to form a solution that acts readily enough on SH_2 and CO_2. As I stated at the meeting, if we had 19 pounds of ammonia per ton of coal, instead of only 6 pounds, we would require neither lime nor oxide for subsequent purification.

"There have been patents taken out in England the object of such being the accomplishment of this purpose; but so far as I can learn, have failed of success. The idea is to revive the liquor, by subjecting it to a heat of about 180°, which drives off the SH_2 and CO_2; then, after cooling, the revived liquor is pumped into the scrubber where it again absorbs these impurities. It would require to be revived some three times to entirely purify the gas.

"I observe that Mr. Robert Harris, President of the British Gas Institute, in his recent inaugural address before that body, draws attention to this subject. He concludes his remarks with these words, 'I commend to the younger members the consideration of this subject as being a very promising one on which to employ their energies and inventive talents.'"

Annual Meeting of the British Gas Institute.

The Twenty-first Annual General Meeting of the Gas Institute was held on the 10th, 11th, 12th, and 13th days of last June, at the Institution of Civil Engineers, Great George street, Westminster, London, Mr. Robert Harris, M. Inst. C.E., in the chair. To say that the sessions reflected credit upon the members of the Institute is but to repeat what everybody knows; and the 873 names on its membership lists goes to show how representative of the English gas interest the organization really is. Ten papers of sterling worth and merit were read and discussed, and the Birmingham Medal was awarded to Mr. Frederick Siemens. The medal is awarded every alternate year, and this is the second time of its presentation, Mr. G. Livesey (1882) having been the first recipient. The gentleman selected to fill the position of Chairman of the Institute for the ensuing year was Mr. Thomas Newbigging, of Manchester—a name as well-known on this side of the Atlantic as on the other; Manchester was also chosen as the place for holding the annual meeting for 1885. The suggested alterations in the rules governing the Institute were not passed at the meeting, but go over for another year. The annual dinner appears to have been rather poorly attended in point of numbers; but, in all other points, was nevertheless very enjoyable. The excursion on the closing day was a great success. We will reproduce, in our future issues, the President's Address, and the most noteworthy papers presented, viewed from the standpoint of the gas industry in the United States.

Something about Connellsville Coke.

The Frick Coke Company, of Connellsville, Pa., has published a pamphlet descriptive of the process employed in manufacturing coke on a large scale. The following particulars are taken there from:

Connellsville coal, from which this coke is made, is very soft and easily mined, one miner being able to break down and load a daily average of seven wagon loads, of 33⅓ bushels each. The coal is hauled to the ovens from the mines in trains, of about four wagons each, drawn by mules. The coal is dumped from the wagons into an iron larry of a capacity of about 100 bushels. The larry is a square iron wagon running on railroad tracks directly over the ovens, the coal being dropped from the bottom of the larry into the oven through a suitable opening at its top. An average charge of 7,600 pounds of coal is put into each carbonizing chamber, and, after 72 hours of roasting, 4,800 (or thereabouts) pounds of coke are taken out. When the sulphur and gases contained in the coal have passed off, and the coking operation thoroughly completed, pure water is introduced into the oven by means of a long iron pipe, and the fire extinguished. The coke is then drawn out of the ovens with the aid of long iron hook rakes, and loaded directly into the railroad cars. The heat retained in the walls of the ovens, after the coke has been drawn, is amply sufficient to ignite the succeeding charge.

For extinguishing the fire in ovens pure water is necessary to insure the purest coke. If the water contains a large percentage of impurities the coke absorbs them, and is not well adapted to the smelting of metals. The coke manufacturers of the region were formerly obliged to use water from the small streams draining from the neigboring coal mines, and, as a consequence, strongly impregnated with sulphur impurity. To avoid this trouble, the company, at a cost of $100,000, constructed a water works, taking its supply from the Youghiogheny River, thus insuring an unlimited supply of untainted water.

The following is stated to be an average analysis of the Frick coke product, as given by a professor connected with Pennsylvania State Laboratory:

Water at 225°	.030
Volatile matter	.460
Fixed carbon	89.576
Sulphur	.821
Ash	9.113

The pamphlet makes the rather astonishing statement that 7½ bushels of Connellsville coke will smelt as much iron as will be accomplished by the use of 12 bushels of ordinary gas works coke. This comparison is decidedly unfair to the latter material.

Railroads weigh all coke shipped from the Connellsville region, and weights by railroad scales nearest works loading coke invariably govern settlements. All Connellsville coke is sold by the net ton of 2,000 pounds; weighs 40 pounds to the bushel; measures 50 bushels to the ton; measures 2,688 cubic inches to the bushel; measures 134,000 cubic inches to the ton.

[Official Report.—Continued from page 291.]

Seventh Annual Meeting of the Western Gas Association.

Held at the Southern Hotel, St. Louis, Mo., May 14, 15, and 16, 1884.

First Day—Afternoon Session.

When the discussion on the subject of Mr. Miller's paper had been closed, the chairman announced the appointment of the following gentlemen to serve as a committee on examination of the books and accounts of the Treasurer: Messrs. E. J. King, A. T. Averill, and T. A. Cosgrove.

Mr. B. E. Chollar, of Topeka, Kansas, was called upon to read his paper on

Practical Photometry.

To the greater number of gas companies that are not required by law strictly to maintain their gas at a prescribed standard, the frequent determination of its illuminating power would appear to be a matter more of personal satisfaction than of business importance.

If, however, we consider the fact that in respect to light giving power it is a very excellent gas that has 10 per cent. of its volume in illuminating material, and that a destruction of that substance to an extent corresponding to 1 per cent. of the whole volume of the gas, may result in a 12 or of 15 per cent. loss of light, and that the complete utilization, as far as actually practicable, of the whole of the light-giving components of the gas, can result in an as yet practically undeveloped margin of nearly one-quarter in favor of gas light to be used against competing lights—it would appear that a simple and easy method for the quick and accurate determination of the best way to use the gas as we find it, might be a matter more of actual business importance than of personal satisfaction.

In order to estimate the actual value of the gas in itself, in regard to its light giving constituent, it is necessary to have a reliable standard as a basis of comparison. For the comparison of the fitness of different burners no such standard is required, as the question will always be one of light *versus* money, and the best burner for a particular purpose will be the one which, with any particular gas, will develop the most light in proportion to the cost.

The method of light measurement, as practised in this country and in England, or, more properly, in England and this country, is much the same as the manner in which it is said that they weigh pigs in Arkansas. It is said about the people of that State, when they want to weigh a pig they tie a sack of stones to one end of a pole, attaching the pig to the other end, balancing the pole over the top timber of a rail fence. The interested parties then "guess" at the weight of the stones, and take the weight of the pig at the same figure.

We seem to measure our light in pretty much the same way. We put a gas burner at one end of a stick and a candle at the other, and equalize the light with great care and precision; but after all our pains we can only "guess" at the value of the light of the candle—for, according to our practice, there is no actual certainty about it.

It is a well-known fact in photometry that, with ordinary gas, the intensity of the light developed depends far more upon the fitness of the burner than upon the actual illuminating components in the gas itself. For example, only a few days ago, in a test of a burner taken from one of our public buildings, it was shown that the light from it cost 2½ times as much as from an equal quantity of gas used with a suitable burner. It cannot be denied that the same rule holds good with candles, although perhaps not in so great a degree.

According to our method, it is assumed that, within certain arbitrary limits, the light from a standard candle is in direct proportion to the weight of the material consumed. Such an assumption is not warrantable; indeed not nearly so much so as that, within corresponding limits, the light from a standard gas burner will bear the same relation to the amount of gas consumed; for any inequality in the texture of the wick will correspond to a change in the form of the burner; and as a change in the burner may affect the light to a much greater degree than the gas consumption, it is fair to assume that a variation in the wick will produce a corresponding result. Moreover, it has been shown, by actual experiment, that two candles of the same kind, or even two halves of the same candle, may differ very materially in light giving power, with the same rate of sperm consumption.

The German method of obtaining a standard of light from a candle, by means of a flame of constant light, is much more rational; and by reason of its extreme simplicity, accuracy, and practicability, would seem to leave little to be desired in that line.

It has been established that with candles, such as are used for photometrical purposes, a flame of a certain prescribed height will afford a practically invariable standard of light.

With us the candle is supposed to give the standard of light when the sperm is consumed at the rate of two grains per minute—with them the wick is clipped with scissors, and the flame actually brought to a standard height of 50 millimeters.

With such a standard of light, and with an adjustable rheometer under the standard burner, so that it can consume neither more nor less than just the desired quantity of gas per hour, we can at once discard three-quarters of the expensive and troublesome apparatus usually found in a photometer room; and, at the same time, simplify the manipulation to such an extent that the practical determination of the illuminating power of our gas need be but a matter of a few minutes work, and an operation entailing very little trouble.

The apparatus required for the rapid and accurate test of the comparative fitness of burners is necessarily a little more elaborate than that required for estimating the quality of the gas, yet it is quite simple and easily constructed; and further, with the exception of a pair of good test meters, need not be of any considerable cost.

A plain bar of wood, having a burner pillar at each end; the usual sighting box carrying the paper disc; a paper scale pasted to the bar; a pair of test meters, indicating feet per hour by minute observations; a double stop-cock, by means of which a single movement of the hand will serve to pass the gas either around or through both meters without putting out the light, is about all that is needed.

The scale should be graduated in terms per cent. as well as in candles, so that the same apparatus can be used for illuminating power experiments. The burner pillars should not be fastened in place until after the scale has been pasted to the bar. By this means any shrinkage of the paper will not affect the accuracy of the scale, for the 9 candle point on the scale will be exactly one-half the distance from the middle of the bar to the center of the light. It is well to have the burners movable in a vertical line, so that with any height of burners, candles, or lamps, the lights may be made to range with the center of the disc.

The photometer bar scale will show, by direct inspection, the percentage of the difference in the lights, the meters, the difference in the rates of consumption of gas, and a percentage table, similar to the one herewith submitted for inspection, will show the actual relative cost of the lights, taking into consideration the gas used and light given. Any kind of practical tests of burners can be made in one minute each, without the necessity of putting a pencil to paper.

The system as above described has gradually developed into its present shape. There is nothing about it that is patented, and it is entirely free for the employment of any one who may think enough of it to get up his own apparatus and use it.

The table appended hereto gives the points for calculating a Bunsen bar of two meters between the lights. The distances are from the middle of the bar, and are given in millimeters. Every point has been calculated in detail, and can be depended upon as accurate within the limit of one millimeter.

For calculating a Bunsen bar, the following will be found simpler and neater than the formula printed in Sugg, Bowditch, and others.

Divide the distance between the lights by the square root of the number of candles increased by unity; or, in algebraic language,

$$X = \frac{D}{\sqrt{n+1}}$$

Messrs. Somerville, Starr, Moran, and McMillin discussed the subject to some extent, at the conclusion of which Mr. Burtis moved a vote of thanks be tendered to the gentlemen who had already read papers. The motion was carried, and the Chairman (Vice-President Lansden) announced that the remaining portion of the afternoon session would be devoted to a consideration of routine matters.

Mr. Burtis called attention to the fact that no copies of the constitution and bye-laws of the Association had been printed. He thought this was decidedly an oversight, and moved that the Association order the printing of 250 copies of these documents. A motion to amend the number by increasing to 500 was lost, and the original resolution prevailed.

Mr. Thomas Smith, from the Committee on Nomination of Officers for ensuing year, presented the following report:

Gentlemen of the Association: Your committee, appointed to nominate officers for the ensuing year, would respectfully recommend that the following-named gentlemen be chosen to fill the respective offices assigned—

For President—Thomas G. Lansden, St. Louis, Mo.

For First Vice-President—James Somerville, Indianapolis, Ind.

For Second Vice-President—J. W. Butman, Decatur, Ills.

For Secretary and Treasurer—A. W. Littleton, Quincy, Ills.

For Board of Directors—J. B. Howard, Dubuque, Iowa; James M. Starr, Richmond, Ind.; Peter T. Burtis, Chicago, Ills.; Henry Clark, Kansas City, Mo.; Prof. S. H. Douglas, Ann Arbor, Mich.; L. C. Scofield, Fort Scott, Kansas; Geo. H. Wells, Nashville, Tenn.; E. McMillin, Columbus, Ohio; J. G. Miller, Green Bay, Wis.

All of which is respectfully submitted.

Thos. Smith,
J. W. Butman,
Jas. Montgomery,
} Committee.

Mr. Moran moved that the report be accepted. Agreed to. Mr. King moved that Mr. Gimper be instructed to cast the ballot of the Association in favor of electing the gentlemen named in report of committee. This motion was carried, and Mr. Gimper reported that he had done as directed.

When the result of the ballot had been announced a long discussion took place upon the propriety of following out the plan of appointing a committee to nominate officers, and then, upon receipt of the report, instructing some one gentleman to cast a ballot for the Association. When the matter had been thoroughly ventilated the question was settled by the passage of a resolution requiring that nominations for officers be made in open convention, such nominations to be voted upon by each member present. It was then agreed to hold an evening session, and the Association adjourned, to reconvene at 8 o'clock P.M.

First Day—Evening Session—May 14.

The Association resumed its deliberations at the time appointed. Vice-President Lansden said: Several papers have been assigned for this evening, but as the attendance is not very complete I would suggest, if any gentleman can present a topic for discussion likely to be of general interest, an informal conversation be kept up, as I very much dislike to have the regular papers read without all the members being on hand to hear them. If I do not mistake, last year Prof. Douglas tried a sort of new departure in the use of a new material for purifying purposes, some account of which he gave us at our last annual meeting.* I would ask the Professor if he is still using that material.

Professor Douglas—Yes, sir; I still adhere to its use. In accordance with the suggestion of our Chairman, and noticing the presence of a number of gentlemen who were not in attendance at our last annual meeting, I am willing to briefly recount my experiments in the direction indicated. Not being thoroughly satisfied with the action of lime in purifiers, I tried copperas, iron filings, and sawdust. These mixtures not proving successful, and being aware of the presence of a large deposit of "bog iron," located about one-half mile distant from my works, it occurred to me that perhaps this material might be of service for the purpose desired. I may here remark that we have a great number of springs in the immediate neighborhood of Ann Arbor, the waters of which all carry iron in the form of salts, these salts being freely deposited, on exposure to the air, at the mouths of the springs. One of these springs was located in a meadow nearly level with an adjacent river. The water bubbled up in the center of a mound that had been formed by the iron deposited, and this mound was from 6 to 8 feet in height and from 10 to 15 feet in diameter, nearly circular in shape. I dug into the sides of the mound, and found that the material of which it was composed carried about 40 per cent. of the iron oxides. I had some of it carted away, broken up, dried, and placed in my purifiers. The first date of trying it was over eight years ago; it has answered the purpose so well that I still employ it to the exclusion of everything else—not even using a single bushel of lime. I have repeatedly tested the gas for carbonic acid, and never have found more than a trace. In a quantitative analysis, made a few days ago, to determine the amount of carbonic acid present, I could discover only 0.26 of one per cent. It removes the sulphur entirely, and is easily and completely revivified. I have been troubled a good deal with tar in my purifiers. The presence of this substance, of course, more or less injures the oxide for purifying purposes; but my loss on this account is never greater than the waste occasioned by throwing away about one-tenth of that contained in the lower screen—a loss that is inappreciable on account of its low first cost. After removing it from the purifiers, leaving it exposed for two or three days and shoveling over once, it returns to the condition of a ferric salt, becomes red in color, as originally, and is in condition to do its work over again. I have found, from actual experiment, that a bushel of this native oxide of iron (if I may so call it), weighing about 70 pounds, will purify something over 200,000 cubic feet of gas. A short time ago I went back over our records for the purpose of obtaining the figures as to cost of purification when using lime. From an average of the figures for four years prior to the use of the iron mixture I found that the lime system cost 4½ cents per thousand. The cost now does not exceed one-half a cent per thousand, and besides the purification was far superior. The material never corrodes the screens. A simple reversal of the screens is all that is needed to free them of the material, there being no occasion for scraping.

The Vice-President—How do you account for such complete extraction of carbonic acid? Generally it is understood by those using iron that oxide is not a good extractor of this impurity. This, to me, is a very interesting question.

Prof. Douglas—Yes; that question was raised at Cincinnati. Although it is somewhat anticipatory of a paper which I intend to present before the sessions are terminated—[The Vice-President here interrupted the speaker, saying if such was the case Prof. Douglas would be excused from answering.] I thank the Chairman for his courtesy, but think it expedient to attempt an explanation of the fact now. The native mixture contains from 40 to 50 per cent. of oxide, the balance being principally composed of clay and sand. All porous materials, soil more particularly, are great absorbers of gases. We see a good illustration of this in the earth closet. This mixture will absorb large quantities of ammonia and carbonic acid by virtue of the soil that is mixed with the iron oxide, as it appears to me, on the same principle on which the earth closet acts. I was somewhat at a loss how to account for this at first, but think the reasons here given are sufficient to answer the question propounded.

Mr. Smith—Do you use the oxide in its native state?

Prof. Douglas—Yes; in its native state.

Mr. Smith—Do you use any sawdust?

Prof. Douglas—Just a trifle on the bottom screen.

Mr. Smith—That is similar to my practice.

Mr. Somerville—Is it not the ammonia that removes the carbonic acid?

Prof. Douglas—It may possibly be chargeable to the ammonia as well as to the clay. It might be absorbed by the carbonate of ammonia; I am not prepared to say that is not the case. To-morrow I will have some samples of the material. It is not like the Connelly mixture, which is more or less granular in its structure, but exists in the form of fine powder.

Mr. Smith—How do you place it in your purifiers?

Prof. Douglas—We have four purifiers—8 by 10, with five screens—over which screens the material is placed in thin layers. When using lime we had to change the purifiers every day, sometimes twice a day, in order that the gas might be kept pure. Now, even in mid-winter, we change them about once in three weeks.

Mr. Smith—Why do you not put it all on one?

Prof. Douglas—I tried that method, but got too much back pressure. Following out my present practice, I get only one-tenth of an inch back pressure.

Mr. Smith—Do you think this native mixture will last you better than common iron borings?

Prof. Douglas—Yes; I have tried iron borings, sulphate of iron, and copperas.

Mr. Smith—Of course it is cheaper, even should it not last as long.

The Vice-President declared that himself and the members were much indebted to Prof. Douglas for his remarks.

Recurring to the regular order of business, Mr. E. McMillin, of Ironton, Ohio, was called upon to read his paper, entitled

Testing the Value of Coal for Gas Making.

Having devoted considerable time and attention during the past year to ascertaining the value of various coals that are being sold as gas coals in our section of the country, I have obtained results which I believe will at least interest the members of the Association. And if there be any manager present who knows as little about the question as I did before making the tests, the results of which are here submitted, he will doubtless not only be interested but also instructed.

As I am not in the employ of any coal company, and am not paid for advertising the good or concealing the bad qualities of any individual's or company's coal, I shall give no names, but refer to the tests by numbers. In submitting these tests I give you only a small portion of the number that were made, but have selected what I think will fairly represent an average of the whole series.

Our test works is composed of a set of 3-inch air condensers, a dry scrubber, two purifiers, station meter, and gasholder (capacity, 1,000 feet). We charge the coal into one of a bench of six retorts doing regular work, but with a valve between the mouthpiece and hydraulic main, and a 4-inch pipe leading off from standpipe to the condensers in the test works. We have no seal. The gas does not get the benefit of an exhauster; but we counterweight the holder until the back pressure equals but 1¼ inches. One of the purifiers is filled with oxide of iron, and the other with hydrate of lime.

Test No. 1.

Coal charged	150 pounds.
Gas made	576 feet.
Yield per pound of coal	3.84 feet.
Candle power	15.5
Candle feet	59.52

	Pounds.	Per cent.
Weight of gas	22.15	14.77
" coke	86.50	57.67
" tar	5.00	3.33
" water	9.00	6.00
Weight lost	27.35	18.23
	150.00	100.00

* For paper by Prof. Douglas on this subject see Vol. XXXIX. of Journal, date of August 26, 1883, page 51.

Test No. 2.

Coal charged	150 pounds.
Gas made	609 feet.
Yield per pound	4.06 feet.
Candle power	15
Candle feet	60.90

	Pounds.	Per cent.
Weight of gas	23.42	15.61
" coke	94.00	62.67
" tar	4.00	2.67
" water	10.50	7.00
Weight lost	18.08	12.05
	150.00	100.00

Test No. 3.

Coal charged	150 pounds.
Gas made	649 feet.
Yield per pound	4.33 feet.
Candle power	16.2
Candle feet	70.2

	Pounds.	Per cent.
Weight of gas	24.96	16.64
" coke	98.00	65.33
" tar	2.50	1.67
" water	7.50	5.00
Weight lost	17.04	11.36
	150.00	100.00

Test No. 4.

Coal charged	150 pounds.
Gas made	669 feet.
Yield per pound	4.46 feet.
Candle power	16.50
Candle feet	73.59

	Pounds.	Per cent
Weight of gas	25.73	17.15
" coke	106.00	70.67
" tar	2.50	1.67
" water	9.27	6.18
Weight lost	6.50	4.33
	150.00	100.00

Test No. 5.—Cannel.

Coal charged	200 pounds.
Gas made	900 feet.
Yield per pound	4.50 feet.
Candle power	19.00
Candle feet	85.50

	Pounds.	Per cent.
Weight of gas	34.62	17.31
" coke	122.00	61.00
" tar	3.50	1.75
" water	7.50	3.75
Weight lost	32.38	16.19
	200.00	100.00

Test No. 6.—Cannel.

Coal charged	200 pounds.
Gas made	1000 feet.
Yield per pound	5 feet.
Candle power	19
Candle feet	95

	Pounds.	Per cent.
Weight of gas	38.46	19.23
" coke	128.00	64.00
" tar	5.00	2.50
" water	3.00	1.50
Weight lost	25.54	12.77
	200.00	100.00

Test No. 7.

Coal charged	200 pounds.
Gas made	840 feet.
Yield per pound	4.20 feet.
Candle power	14.50
Candle feet	60.90

	Pounds.	Per cent.
Weight of gas	32.31	16.16
" coke	116.00	58.00
" tar	8.50	4.25
" water	23.00	11.50
Increase in weight of lime and oxide	5.50	2.75
Weight lost	14.69	7.34
	200.00	100.00

Test No. 9.

Coal charged	200 pounds.
Gas made	1042 feet.
Yield per pound	5.21 feet.
Candle power	17.50
Candle feet	91.71

	Pounds.	Per cent.
Weight of gas	40.00	20.00
" coke	133.00	66.50
" tar	9.50	4.75
" water	14.00	7.00
Weight lost	3.50	1.75
	200.00	100.00

Test No. 10.—Cannel.

Coal charged	200 pounds.
Gas made	856 feet.
Yield per pound	4.28 feet.
Candle power	19.00
Candle feet	81.32

	Pounds.	Per cent.
Weight of gas	32.92	16.46
" coke	119.00	59.50
" tar	9.00	4.50
" water	20.00	10.00
Weight lost	19.08	9.54
	200.00	100.00

Test No. 11.—Cannel.

Coal charged	200 pounds.
Gas made	917 feet.
Yield per pound	4.585 feet.
Candle power	19.00
Candle feet	87.115

	Pounds.	Per cent.
Weight of gas	35.26	17.63
" coke	114.09	57.00
" tar	11.00	5.50
" water	20.00	10.00
Weight lost	19.74	9.87
	200.00	100.00

Test No. 12.

Coal charged	150 pounds.
Gas made	818 feet.
Yield per pound	5.455 feet.
Candle power	17.2
Candle feet	93.83

	Pounds.	Per cent.
Weight of gas	31.46	20.97
" coke	106.00	70.67
" tar	3.50	2.33
" water	3.00	2.00
Weight lost	6.04	4.03
	150.00	100.00

Having given you detailed results of quite a number of tests, I will trouble you no further with minutia.

Many of these tests were made with coal about which most of you probably know nothing; and, the yield per pound being low, you may get the impression that we were not getting all the gas out of the coal. To satisfy you upon this point, I give you the results of the average of seven tests, not reported here in detail, of Youghiogheny gas coal, with the quality of which you are all doubtless well acquainted.

Yield of gas per pound of coal	5.20
Per cent. of coke	66.11
" " tar	4.92
" " water	5.11
" " loss	4.15

You will observe the per cent. of loss in the Youghiogheny is very much below the average as shown in the detailed tests. My observations led me to believe that the richer the coal was in bituminous matter, and the coal farthest removed from that known as dry burning, showed the least loss in manipulation.

Let me call your attention to Test No. 7. This coal shows 11.50 per cent. of water. It is a dry burning coal. Had been stored for eighteen months, and was perfectly dry.

Quite a number of other tests made from the same pile of coal gave all the way from 12 to 16.5 per cent. of water. This was quite a surprise to me. I looked up the analysis of the coal, made by one of the best chemists in this country. He showed but 5.3 per cent. of moisture present; but his figures also showed 16.68 per cent. of oxygen present, and in looking up the analysis of the various coals tested by me, I almost invariably found the coals giving the largest per cent. of water, in our tests, were shown to contain but a small per cent. of water when analyzed in the laboratory. And these same coals, as a rule, show a larger per cent. of volatile combustible matter than does the Youghiogheny gas coals that, in practice, produce 25 per cent. more gas and 50 per cent. less water.

The average weight of the gas and tar combined, from good Youghiogheny gas coal, equals only about 25 per cent. of the weight of the coal. After the experience obtained in making these tests I am inclined to regard with suspicion any coal reported to have more than 37.50 per cent. of volatile matter, but shall, for my use, seek for coals with 34 to 37 per cent. of volatile matter, and, after that, the coal containing the lowest per cent. of oxygen.

Many of the tests here reported have been verified by using a car load, and, in some instances, as much as 100 tons of the coal. Tests 10 and 11 were made from coal taken from same pile, but on different days. You will observe that the different percentages are nearly identical in the two tests, in everything except quantity of gas produced.

Test No. 7 gives the increased weight of the purifying material. Several other tests made gave about the same results, but they were all made with clean lime and oxide in boxes. What the result would be if several tests were run through without change was not determined. Here is where a portion of the "loss" may be accounted for, but only a small portion. Where shall we look for the remainder is a question that has bothered me somewhat. It does not occur from leaky apparatus, as the per cent. of loss is often one-half—occasionally equals, and sometimes exceeds, the per cent. of gas.

The loss, in fact, is greater than here shown. We were compelled to throw some water on our coke before weighing; but never cooled it so it could be held in the hand, and it sometimes was hot enough to set fire to a wooden box in which it was weighed. Again, I have estimated, as a matter of convenience, all the gas to be of about .500 specific gravity, while, in fact, none of it would probably reach that figure.

The coke would probably be very slightly increased in weight on exposure to the atmosphere, by the re-oxidation of the partially reduced metals of the ash. While, on the other hand, this increase would be much more than counter-balanced by the reduction in weight from oxidation of the carbon.

I will close this paper by calling your attention to Test No. 12. That shows, in my opinion, a model gas coal.

When Mr. McMillin finished reading his paper the Vice-President called the attention of the Association to the value of the figures presented, complimented the author upon his exactness, and said that the subject so cleverly treated upon was of the greatest importance to the gas engineers of the country. In the discussion that ensued Mr McMillin explained in precise manner the method followed in such style as to convince his hearers of the thoroughness and impartiality with which the work had been done.

Mr. Gimper moved that a vote of thanks be tendered to Mr. McMillin for his very able and exceptionally interesting paper. This motion was unanimously carried. The Vice-President then called for the report of the committee appointed to determine upon a place for holding the next meeting. Mr. Hyde, from that committee, said it had been the custom of the Association, since its organization, to hold the annual meetings within a regular circuit of the following-named cities, beginning with St. Louis, Mo., then going to Chicago, Ills., Indianapolis, Ind., and Cincinnati, Ohio, in rotation. The present session being held in St. Louis, if the previous practice be followed, the meeting of 1885 would be held in Chicago. The committee recommended that the usual course be pursued; and, in accordance with that idea, named Chicago, Illinois, as the place to hold the Eighth Annual Meeting of of the Western Gas Association.

On motion of Mr. Somerville the report was received, and the suggestion contained therein adopted.

The Association then adjourned, to re-assemble at 10 o'clock on the morning of the following day.

Second Day—Morning Session.

Vice-President Lansden called the members to order at the appointed hour. The first business on the programme was the reading of a paper, by Mr. Edward Lindsley, of Cleveland, Ohio, on

THE FUTURE OF GAS AND THE GAS OF THE FUTURE.

In attempting to consider the possibilities, or probabilities, or to any extent forecast the future of a commodity that has assumed such commercial importance as has illuminating gas, the mind almost involuntarily, and, of necessity, reverts to its past and early history. Therefore, although the title of our subject would seem to confine us to considerations wholly within the future, may we not, by way of introduction to our subject proper, make brief reference to the past history and present status of our topic. Nor need we go far into the history of the past to find a time when the very word even had no existence. It seems to have been invented or introduced as a generic term to designate any aeriform fluid which is neither liquefied nor solidified at ordinary temperature and pressure, by Jan Baptista Van Helmont in the early part of the 17th century.

Van Helmont was born in Brussels, 1577, and educated for the church; still his tastes seem not to have run in that direction, but rather toward chemistry, natural philosophy, and medicine. Apparently somewhat tinctured with the mysticism of alchemy, he nevertheless did much to advance true chemical science and help its approach to exactness. He was a close observer, and made some important discoveries; among them, as he put it, "that air diminishes in bulk when bodies are burned in it,"—a statement that would indicate that his investigations had led him very close to a clear conception of the true theory of combustion, and so to the elimination and after use of gaseous fluids. Of course his knowledge of the gases he examined could not have been accurate, although he produced and examined many, giving them characteristic names according to the conditions under which he recognized them, or the means and substances he employed in evolving them; and he was probably the first to distinguish between gases and vapors. Doubtless, for our present purpose, it would be neither interesting nor profitable to trace, step by step, the slow advance of science through the centuries, or even from Van Helmont to Priestley and Cavendish. We, therefore, forego making the acquaintance of a long line of thinkers and investigators, who were variously near to or far from true and exact science, and come to the consideration of facts revealed, and thoughts suggested, by and with the advent of modern chemistry.

Just at what time chemistry became so far developed as to deserve the name of science it would be impossible to determine. It is often spoken of as a recent science; this, however, is not true, for there is every evidence that many important chemical facts were known at a very early day. The remnants of works of art of known antiquity attest a knowledge of chemistry without which they could not have been made. Suffice it for our purpose to say that, in the 18th century, and especially in the latter half and near its close, the investigations of such men as Priestley, Cavendish, Macquer, Scheele, Dr. Hales and others, culminated in the abandonment of old theories and notions, such as the phlogistic theory of Stahl, and others equally absurd, and in place thereof the establishment of a correct idea of combustion. Oxygen was discovered by Priestley about this time, and almost simultaneously with him by the Swedish chemist Scheele. Hydrogen was known at an earlier period, but its real nature was first described, in 1766, by Cavendish.

A knowledge of the real nature of hydrogen and the discovery of oxygen was closely followed by the discovery of a number of other simple elements, some of which were gases; and so rapidly did these discoveries multiply that the idea that every thing in nature was susceptible of conversion to a gaseous state had a numerous and very respectable following. The process of destructive distillation revealed a range of substances, from which a combustible gas was obtained, truly astonishing—among them coal, wood, peat, resin, oils, both mineral and animal, water, etc.

The introduction of coal gas as an illuminant is doubtless due to Mr. William Murdock, of Cornwall, England, where he made his first experiments about the year 1792. In 1798 he moved from Cornwall and constructed gas apparatus at the Soho Foundry, for Messrs. Boulton, Watt & Co., steam engine builders. His operations were for some years of an experimental character, until 1802, when a successful public display of the light was made, after which the plant was extended and all the principal shops at Soho Foundry were lighted entirely by the new gas illuminant.

According to Richards, the first public street lighting took place in Pall Mall, London, on the 28th of January, 1807, and was an event which naturally dispelled many of the doubts existing as to its practicability. In 1813 London Bridge was lighted, and about the same time the system had extended to many of the streets in that part of the city.

From that time on gas gradually and increasingly came into use, until to-day it is used more as a necessity than as a luxury in nearly every large city on our globe. Not only is this true of the large cities, but small towns, both in this country and the old world, manifest early and ambitious desires regarding the erection and extension of gas plants. Hitherto these plants have been, for the most part, adapted to the manufacture and distribution of coal gas, and chiefly for illuminating purposes. Not wholly so, however, for, as previously stated, there is a wide range of substances

adapted to the manufacture of combustible gas, and perhaps an equally wide range of distinctively different apparatus for the manufacture.

What will be the gas of the future and what will be the future of gas are questions as interesting to us now as they were to mankind when they first witnessed the brilliant displays made by Murdock. In these later days new contestants have entered the field of artificial illumination, the chiefest and strongest of which is, doubtless, petroleum. It has been greatly improved since its first introduction as an illuminant, but not sufficiently so as to drive gas from the field; on the other hand, notwithstanding it furnishes a very good and cheap light, it lacks to a striking degree the conditions of cleanliness, convenience, and safety, that are such prominent characteristics of gas, and doubtless these objections will always play an important part in retarding the general use of oil.

Its one advantage is that it is cheap; but it is probably as cheap now as it will ever be. Not so, however, is this the case with gas. Striking and marked improvements in the process of its manufacture are not of frequent occurrence; still some improvement is made from time to time in this direction, tending to cheapen production and distribution. But, best of all, gas managers are becoming wise enough to furnish gas as cheaply as is possible under the existing conditions. Indeed, recent considerable and general reductions have been made, resulting, as a rule, in marked increase in consumption. Of course increase in consumption tends to decrease the cost of distribution, with the ultimate result of making possible still further reductions. So far as petroleum is concerned, doubtless the day is not far distant when, all things considered, it will not have even the advantage of cheapness.

A less formidable rival to the continued use of gas, in the judgment of the writer, is electricity—and this is said in the full recognition and conviction of the fact that this dazzling but somewhat erratic light has a field of usefulness before it, and has doubtless come to stay. It is equally a matter of belief and conviction that, if it ever becomes a general commercial illuminant, in any such sense as is gas or petroleum, that time is still in the distant future. Wonderful as has been its development, much remains to be done before it can take its place as fulfilling the wide range of conditions demanded of a successful artificial illuminant. Let us query, "What are some of those conditions?" Prominent among them are cheapness, safety, and controllability. The first condition is not met by the production of a maximum quantity when only a minimum is needed. If it be admitted that a hundred thousand candles, subdivided into parts of one or two thousand candles each, can be furnished and used as furnished or not as the case may be, as cheaply as a similar equivalent of gas, it by no means follows that the one is as cheap as the other, when conditions as they practically occur are considered. If a light of 18 candles will meet the necessities of a given case, it becomes difficult to see how it can be economical if, in order to get the 18 candles wanted, you must pay for an additional thousand or two.

The numerous deaths, accidents, and fires known to have resulted during its short career cannot be ignored as factors in deciding the question of safety. The opinion is respectfully submitted that controllability is hardly expressed in a light that is rated into hundreds of candles on the one hand, or total extinction on the other—to say nothing of the wonderful and incessant vibrations between these conditions practically exhibited in the every day or night action of the average arc light.

But it may be urged that subdivision is realized in the incandescent form, in lights ranging from 8 or 10 candles upward; but, as in the case of the arc system, as may be inferred from what has just been read, can the question of controllability be dissociated from that of economy? In coming to a conclusion on this point it would assist one materially if a few facts in relation thereto could be positively and absolutely known from the standard of practical use. Inasmuch, however, as this is something that no man outside the incandescent ring has yet been able to find out, we must be satisfied with such conclusions as general observation will enable us to make.

It is urged by the admirers of the electric light that it is yet in its infancy; but, so far as the principles of incandescence are involved, it appears to the writer as rather an aged infant. If memory serves aright, in 1845 or thereabout, Professor King, of Ohio, brought out and publicly exhibited little glass bulb containing a vacuum and a slight thread of platinum wire. This device differed but little from the Edison, Swan, Maxim, and other incandescent lamps of to-day; the principal difference, so far as the lamp is concerned, being a less perfect vacuum (the Torricellian method of producing it having been invented since King's time), and a thread of carbon in place of the platinum wire. This was a world's wonder for a time, and completely demoralized gas interests for a short season, both in this country and in Europe. It served to illustrate the possibilities of electricity, but was not a success. This allusion to it is made as indicating that the incandescent had much the start of the arc system, which practically was a sequence of the dynamo machine.

But how stand they related to each other and to gas? Now, our city of Cleveland may be called the home and birthplace of the most successful arc lighting system in the world. There is also in operation there to-day, and has been for more than a year, an Edison plant—an Edison agency, I think, is there also. One large store was fitted with Swan lights in connection with the Brush storage system; but I venture the assertion, so far as units of light go, that there are hundreds developed by the arc system to one by the incandescent; and, if we may judge from what we see, and can gather from the press and otherwise, Cleveland fairly represents the conditions obtaining in other cities in this regard. As to the gas interest there, I hazard nothing in saying that at no time in its history, save possibly during two or three of the first years of its use, has the consumption of gas increased so rapidly as during the past two or three years; and further, if we depend upon what we hear from other places, Cleveland is, in this regard also, no exception to the general rule.

Opinions will vary as to the future of electricity for the purposes of general illumination; but to the writer's eyes many grave, if not insurmountable, difficulties appear. That it is well adapted to isolated installation, where power is cheap or cost a secondary consideration, there is no manner of doubt. Nor would I question that it may be advantageously used, under favoring conditions for its production, where large quantities in constant and unvarying measure can be used, and quality as to steadiness is not indispensable; indeed, I believe it has a large and, like itself, a dazzling future before it.

It may appear for a time to encroach upon the field of gas; but, in the main, I believe its field will be in the future as it has thus far been—a new one, tending rather to increase than to diminish the use and usefulness of gas.

The foregoing suggestions, as to the effect of petroleum and electricity upon the future of gas, have been made because they have seemed to be in the line of thought of very many of our fraternity as embodying about the bulk of influences likely to affect the future of our industry. They have also been made in acceptation of the condition that gas in the future, as in the past, will be chiefly used as an illuminant. That it will be so used, at a cheapened cost, in vastly increased measure, I have no doubt. But will it stop there? I fancy that the future will develop new uses for gas, uses of a nature that will gratify and surprise its most ardent friends.

The gas cooking stove, a device of comparatively recent origin, thus far used in a limited way, has ceased to be a novelty, and will be a factor of increasing consumption in days to come. Several pages of the March 3, 1884, issue of the American Gas Light Journal were devoted to a paper descriptive of mechanical devices and processes (many of which were new to practice), demanding the use of gaseous fuel for their successful operation. I saw not long since, in a large Eastern manufactory, a new soldering operation; the melting point of the surfaces to be joined and the solder uniting them were so nearly the same that the success of the process depended upon the use of a nicely adjusted gas jet operated by an expert workman.

Again, when we reflect that the primal source of power developed by the steam engine is resident in the coal consumed in the furnace of the boiler connected therewith, and that the efficiency of that coal is in direct proportion to the perfection of its conversion into gas, and after combination with atmospheric air, we wonder that gas engines are not in more common use. In domestic economy the tendency of the age demands immunity from the inconvenience, labor, dust, and dirt attending the use of solid fuel in ordinary heating devices; and in several cities elaborate systems for steam heating have been arranged, in the vain hope of comfort for the people and profit for the projectors. The question arises, may not cleanly, incondensable gas be delivered to consumers cheap enough to be used for general heating purposes as well as light, solving not only the heating problem, but settling the smoke nuisance at the same time.

While this line of thought is far from being exhausted, perhaps enough has been said to warrant the inference that a little more competition is the only stimulus needed to inaugurate an era of improvement in the manufacture and distribution of gas that will place it in position to exemplify, as it ought, its ability to minister to the wants and comfort of mankind, and assure itself a shining future, in the presence of which its past may appear as hardly more than an insignificant beginning.

I should not voluntarily have undertaken to say much about the gas of the future, as distinguished from the future of gas, were it not from the fact that the title of this paper was originally named by another as a subject for myself to write upon, and accepted without much consideration on my own part. It would take a bright and scientific mind indeed to forecast the future in this regard. These are days of wonderful improvements, and so rapidly do they follow one another that we almost cease to wonder at them. That which is not dreamed of to-day becomes the familiar and well understood fact of to-morrow. However, hydrogen is so widely diffused in nature, and dissociated from its combinations by such a variety of means, that it seems quite natural to suppose that, in some form of combination, it will figure in the future, as it has in the past, as the representative of the gas man's idea of gas. Indeed, the question of interest seems not to be embraced in the

idea of getting anything very different or better than we have, but rather to get larger measure at less cost. That this desirable end will, in some measure, be accomplished there is no doubt; to what extent remains to be seen. The principles of combustion are becoming better understood, and improvements in the application of those principles to practice are being constantly made with sure, if slow, improvement in results. Almighty power poised in space the little ball that we call earth, placed man upon it, and endowed him with physical force and mentality, that he might find happiness in the search for Nature's hidden treasures. In that search what vocation affords a wider scope than ours? Give us the incentive of sharp competition, and who will doubt that the gas of the future will keep pace with the progress of the age? It will light the dark places of the earth, warm its cold corners, and furnish heat and power to relieve man in a measure of the burdens and drudgery of life.

Mr. President, and gentlemen of the Association, I thank you for your kind attention, and bespeak for the Western Gas Association as bright a future as I hope shall be attained by the gas of the future.

Mr. Hyde moved a vote of thanks (carried) to Mr. Lindsley.

[To be continued.]

[Official Report.]

Fifth Annual Meeting of the Central New York Gas Engineers Association.

The Fifth Annual Meeting of the Central New York Gas Engineers Association was held in Corning, New York, on Thursday, June 5. The visitors were met by Mr. F. D. Kingsbury, Treasurer of the Corning Gas Light Company, and by him escorted to the Remington House, which hotel was designated as headquarters.

The first number on the programme was the inspection of the new works at Corning. When we remember that the new works are on the same site formerly occupied by the old plant, we can easily realize what an amount of planning and engineering was done to arrange things as they are. Everything was in "apple pie" order, and "points" (especially to the new members) were cheerfully given.

The business session was called to order at 10.30 o'clock, with President Mr. John McDougall, of Hornellsville, in the chair. Roll call showed that those present were

L. C. North, Canandaigua, N. Y.	L. C. Kingsbury, Corning, N. Y.
W. H. Scrafford, Bath, N. Y.	Wm. Parrish, Seneca Falls, N. Y.
F. D. Kingsbury, Corning, N. Y.	J. H. Case, Fulton, N. Y.
Wm. Humphreys, Danville, N. Y.	P. S. Merrifield, New York City.
John McDougall, Hornellsville, N. Y.	John Gribbel, New York City.
A. J. Avery, Dunkirk, N. Y.	H. N. Babcock, Syracuse, N. Y.
George Rider, Norwich, N. Y.	

The report of the Secretary and Treasurer, Mr. William A. Wood, was read; and, on motion, was accepted and placed on file.

Applications for membership were received from Messrs. Frank D. Chase, Rochester, N. Y.; P. S. Merrifield, New York city; J. H. Case, Fulton, N. Y.; John Gribbel, New York city; John J. Griffin, New York city; H. N. Babcock, Syracuse, N. Y.

On motion of Mr. Avery, Mr. North was instructed to cast a ballot for the above applicants. These gentlemen were elected, and those present were introduced to the Association.

A paper on "The Management of Small Gas Works" had been expected from Mr. Parrish, of Seneca Falls; but, greatly to the regret of all present, an unusual demand on his time had prevented him from preparing an article. His apologies were, therefore, accepted with the understanding that his paper should be ready for the next meeting.

A discussion of the possibilities of "Water Gas" then followed, in which Messrs. Merrifield, McDougall, Gribbel, and others, assisted.

The Siemens burner was next considered.

Mr. North had first seen the burner in operation in Buffalo, and had been greatly pleased with its illuminating effect; but thought it was very unattractive in appearance. However, these burners are now made with covers of crystal, with polished brass trimmings, and their appearance has been greatly improved.

Mr. McDougall said that he had a 50 foot Siemens in the Rink, at Bradford, that was entirely satisfactory. This building was about 50 × 60 feet, and he was convinced that wherever the ceilings were of sufficient height these burners would be found a great improvement over the ordinary methods of lighting by small burners, and he considered it superior to, and much more satisfactory than, the electric light.

This subject was further considered by Messrs. Avery, Parrish, Gribbel and others.

A committee was then appointed for the purpose of nominating officers for the ensuing year. While this committee was in session, an informal discussion on bench settings and methods of keeping uniform heats under retorts took place. The committee then reported as follows:

President, John McDougall; Vice-President, William Cartwright; Second Vice-President, William Parrish; Secretary and Treasurer, H. N. Babcock. Executive Committee: J. H. Findlay, William Humphreys, L. C. North, J. H. Case, George Rider.

The report of the Nominating Committee was accepted, and the above named gentlemen elected to the positions as stated.

An invitation from Mr. A. C. Wood, of Syracuse, was read and accepted, inviting the Association to meet next year in Syracuse; and, at the same time, inspect the new works there as far as then completed.

On motion, the Association adjourned subject to the call of the President and Secretary.

It is a matter of regret that several papers promised for this meeting should have failed to appear; but all united in thinking that the meeting and the interchange of the ideas of the members has been of great benefit to those who attended.

After adjournment, all present were invited to dinner; and, as it was ordered by Mr. Kingsbury, no one will doubt but that the banquet was a good one, and the rest of us are witnesses to the fact that each man did his duty—to put it very mildly. After dinner all turned out to see the factories in which is made the finest cut glass in this country, if not in the world; and as one on entering saw the raw materials it seemed impossible that the beautiful decanters, glasses and dishes of different sorts could have been made from these elements, even though combined with wonderful skill and labor. To most of us it was a novel sight and will long be remembered. As the evening approached, trains for all directions were boarded by the gas men; and by night the out-of-town brethren had departed, and so ended the Fifth Annual Meeting of the Central New York Gas Engineers Association.

H. N. Babcock, *Secretary and Treasurer.*

Action Taken by the Board of Directors of the Washington (D. C.) Gas Light Company when Accepting the Resignation of Mr. B. H. Bartol.

At a meeting of the board of directors of the Washington Gas Light Company, held November 15, 1883, the following preamble and resolutions were adopted:

Whereas, Mr. B. H. Bartol has tendered his resignation of the office of President of the Washington Gas Light Company, which he has held for nineteen years with incalculable profit and benefit to the company, and with great honor and credit to himself; therefore be it

Resolved, That while we accept with profound regret his resignation, we take pleasure in recording upon the minutes of the board our appreciation of the services he has, through the long period of his presidency, at all times rendered to the company whose affairs he has had in charge; his economical, systematic and careful management of the business of the company, his foresight, energy and industry; his perfect familiarity with every thing entering into the manufacture of gas; his insight into the rules that govern the demand and supply of that article; and, above and beyond all, his strict, unflinching integrity, giving to the company the wonderful success that has attended its operations for many years past, and made it one of the most successful corporations of the kind in the country,

Resolved, That Mr. Bartol, during our long connection with him in this board, has won our highest regard and esteem; that we have found him as a friend at all times gentle and affable; as an officer, kind, courteous, dignified and firm, manifesting throughout his presidency a determination so to govern the affairs of the company that both its interests and the interests of the community should be served in the best possible manner,

Resolved, That these resolutions be spread upon the records of the board, and that the Secretary cause a copy of them to be engrossed and transmitted to Mr. Bartol.

[A fit recognition of nineteen years of faithful, earnest work. To the credit of the Washington Gas Light Company be it said that its managers have always been prompt to reward those who have shown faithfulness in their service; and this is as it should be. May its future be as prosperous as its past.—Ed.]

[A Paper read before the Society of Gas Lighting.]

Value of Coke for Generating Steam, Compared with Other Fuel.

By J. L. Hallet.

In 1879 the Legislature of Massachusetts passed an act permitting any gas company in the State to add to its business that of manufacturing and distributing steam for heating and mechanical purposes. The Springfield Gas Light Company availed itself of the privilege, and erected a steam plant consisting of 3¼ miles of mains and eight boilers aggregating 700 horse power.

The company has used 3,800 gross tons of fuel in eight months, two-fifths of which was coke, the balance being anthracite egg, buckwheat, pea, and dust, bituminous slack, and coke breeze. In several instances all coke fires were used.

The items given below were taken from a daily record of temperature, consumption, and kind of fuel—the conditions of comparison being the same—and show the calorific value of coke for generating steam compared with the kinds of coal before named.

There is an opinion prevailing in some places that coke fires destroy furnace grates and the tubes of the boiler to a much greater extent than an thracite coal. This has not been the case in our experience. We have fired one boiler since 1870, and two boilers since 1879, with coke exclusively. The latter have been used continuously, day and night, for eight months in each year, and a careful inspection finds them in as good condition as the boilers fired with anthracite and bituminous coal. The grate bars subjected to coke fires have never been renewed, and are apparently in as good condition as when set.

Statement.

Date.	Temp. of Atmosphere.	Kind of Fuel.	Total Weight.	Pr. Ct. of Total Weight.	Percentage in Favor of Coke.
Nov. 30, 1883.....	32°	Coke	36,000	100	
Dec. 1, 1883.....	32°	Coke	6,000	15	
		Egg anthracite	33,382	85	
		Bituminous slack....	530		10.8
Jan. 9, 1884.....	20°	Coke	27,320	54	
		Pea and dust.....	17,600	35	
		Bituminous slack....	5,527	11	
Jan. 15, 1884.....	20°	Coke	12,640	22	
		Breeze.....	13,838	24	
		Pea and dust.....	20,000	35	
		Bituminous slack....	9,810	19	11.7
Jan. 21, 1884.....	10°	Coke	42,400	80	
		Buckwheat.....	8,082	15	
		Bituminous slack....	2,028	5	
Jan. 22, 1884.....	10°	Coke	13,480	20	
		Buckwheat.....	41,904	63	
		Bituminous slack....	11,268	17	26.9
Feb. 11, 1884.....	33°	Coke	37,626	100	
Feb. 12, 1884.....	33°	Coke	13,440	29	
		Buckwheat.....	27,214	58	
		Bituminous slack....	6,044	13	24.1

Further Explanation of the Mode of Manufacturing Gas from Sawdust as Pursued at Deseronto, Ontario.

By George Walker.

Mr. J. E. Bicknell, in his communication to the Journal, as published in the issue of June 16, seems to labor under a misapprehension regarding the working of my apparatus for manufacturing gas from sawdust, the details of which were outlined in your number of May 2. He (Mr. Bicknell) states that "the Archimedean screw does not carry into effect the principle which the inventor evidently had in mind—namely, the bringing of every particle of wood in the finely-divided state of sawdust into immediate contact with a certain heat sufficiently high to instantly carbonize it and drive off all the volatile matter, and then quickly remove the resultant carbon or charcoal, which, being a non-conductor of heat, would, if allowed to accumulate, greatly retard further carbonization. As before intimated, the screw only partially accomplished this, because it is obvious that as the screw revolves it carries forward a layer of sawdust from five to six inches deep, depending upon the size of the retort, which is, as it were, wound round the screw, the same particles remaining upon the outside and in contact with the surface of the retort, consequently becoming quickly charred, serve only to retard the carbonization of the interior." Thus far for Mr. Bicknell.

Now, as matter of fact, the working of the screw conveyor in the retorts used by me for the conversion of sawdust into gas is not at all like the description given by Mr. Bicknell. In the first place, the retorts are 12 inches in diameter, and the hub of the conveyor-flights is 6 inches in diameter; consequently, even if the retorts were filled with sawdust, the layer of it contained between the shaft and the interior surface of the vessels could never exceed three inches in thickness. In reality, through the sawdust being fed slowly into the retorts in small successive portions, and the motion of the conveyor itself being slow—only about one revolution per minute—what actually happens is that a layer of sawdust not exceeding one inch in thickness is gradually pushed along the bottom of the retort, in front of the conveyor-flight, while at the same time the friction of the flight against the sawdust causes the particles to revolve upon one another, and they are thus brought into contact with the heated surface of the retort and carbonized.

In no sense is the *sawdust wound around the screw*. The only way in which this could be effected would be by keeping the retort continually filled with the sawdust material, and running the conveyor at a high rate of speed.

Mr. Bicknell, according to his description of his method, is working on an entirely different and distinct line from the practice followed by me. He produces, from the distillation of the material common to us both, a gas of feeble illuminating power, enriching this by admixture with oil gas. On the contrary, what I have attempted (making here the claim that I have accomplished the object sought for) is the manufacture of a sawdust gas that possesses in itself sufficient illuminating power for all practical purposes, which sufficiency of light-giving quality is obtained without the addition of any enriching material. Simultaneously with this gas production I obtain a quantity of residual products—such as acetic acid, methylic alcohol, tar, etc.—whose commercial value would be entirely negatived by the admixture of petroleum in any form.

When the carbonization of sawdust was first attempted here at Deseronto, an apparatus quite similar to that described by Mr. Bicknell was tried; and it was speedily found that it would be impracticable to use any extended flat surface of cast iron in situations exposing it to high temperatures, for, however well the iron might be protected by fire-brick or tiles, it was sure to warp and crack in a very short period of time, thus ending its usefulness. On account of these defects that system was abandoned and cylindrical retorts substituted—which latter have answered the purpose very well.

It is now proposed to effect a still further improvement, through using D-shaped retorts, and at the same time, in some instances, substitute fire-clay for iron.

In connection with this subject it may be interesting to some of your readers to know that, in the purification of this sawdust gas, I employ a system of wet lime purifiers. These purifiers are three in number, arranged on different levels, and connected to one another by a series of pipes and valves for gas and milk of lime—which latter is supplied to the boxes from a reservoir standing above the highest purifier. The inlet and the outlet pipes are so arranged that the gas first enters into the lowest series, and, after filtering through the milk of lime contained in all three, is passed from the uppermost one, containing fresh lime, into the holder. The saturated lime from the lowest of the series is discharged into a receiving tank or reservoir, where, in a few hours, the carbonate of lime is precipitated, and the clear water remaining above is run off through a cock, the remaining solid content being dug out with shovels, and carted away by the farmers who use it as a fertilizer. The lime saturated with carbonic acid has but little odor when compared with the lime saturated from the purifiers of coal gas works, and is only a trifle discolored.

This method of purification requires very little labor—the mixing of the lime and water, and pumping it into the reservoir from which it is delivered into the purifiers, being all performed by machinery. The quantity of lime used for a given percentage of CO_2 is less than in the case of dry lime purifiers, and the first cost, for purifiers of equal capacities, is much less.

Special English Correspondence.

Communicated by Norton H. Humphrys.

London, June 9, 1884.

The chief, if not (for the present) entirely engrossing matter of interest in gas circles here, is the forthcoming annual meeting of the "Gas Institute," now about to be held at the Institute of Civil Engineers, in London. A glance at the programme of proceedings shows that there is no very special novelty in the list of communications and papers to be read, although, so far as one may judge from their titles, they will well repay careful perusal and consideration; and there is no question, when I mention that it includes the names of Messrs. F. W. Hartley, C. Heisch, G. Livesey, T. Travers, and W. Valon, but that there will be no lack of interesting matter. In point of number the papers are rather behind those of previous London meetings; which, perhaps, is not undesirable, seeing that, on some previous occasions, the discussions have been hurried—it is not very pleasant to speak when the president is staring at you, with his watch in his hand—and the meeting evidently prolonged beyond the patience of some of the members. A great deal of interest will be excited on the present occasion by the proposed changes in the rules, which are both numerous, and, in some instances, of vital importance to the Institute. It is rather unfortunate that any important alterations are necessary, seeing that it is only three years since the

regulations and rules were entirely revised, and such frequent changes are to some extent evidence of weakness. Matters have not turned out in accordance with the anticipations under which the revision was made, and it is to be hoped that the alterations now proposed will tend to the advantage and prosperity of the Institute.

The report of the Council states that the total number of members of all classes now on the books is 873. We have next to notice the proposed alterations. It is proposed to extinguish the class known as "Extraordinary Members," by transfering them to the class of "Associates;" and to form a class of "Graduates." The latter is to comprise "persons not under 18 years of age, holding responsible positions in gas works; or pupils of gas engineers, having the object or intention of becoming gas engineers or managers." So, if this is accepted, the Institute will consist of Members, Honorary Members, Graduates and Associates. Powers are taken to call extraordinary meetings of the members; to appoint (from the members of the Institute) special committees "for the furtherance of the objects of the Institute, and for investigation into matters connected with the manufacture and application of gas; and to appoint examiners, and conduct examinations, and grant certificates of proficiency in the knowledge of gas manufacture." It is also proposed to double the subscriptions of the members and associates, by increasing them from the present 10s. 6d., to 21s. per annum; and the graduates are to be charged 10s. 6d. per annum. During the past three years the members have enjoyed the option of contributing the larger sum, if so inclined. But as only about one-third have availed themselves of this privilege, and it has been shown that the expenses of the Institute amount to no less than 15s. 6d. per member, the need for this alteration is obvious, unless the Institute is to avail itself of the facilities afforded by our new bankruptcy laws. Perhaps some may be disposed to dispute the wisdom of admitting the graduates at two-thirds of cost price. As the only items represented in the expenditure columns, besides the copy of the transactions, which costs 5s. or 6s. per member, are the expenses of three days annual meeting, one days' extraordinary meeting, and the general expenses, there are many who consider that there is room for some improvement in the financial management of the Institute. The Committee of Investigation appointed last year to continue the inquiry into "The Effect of Condensation on the Illuminating Power of Coal Gas," have continued their labors, but are not at present prepared with a further report. The committee appointed to investigate the question of "The Standards of Artificial Light," have engaged the services of Messrs. F. W. Hartley and Charles Heisch, and these gentlemen have conducted experiments, with apparatus kindly placed at their disposal by the directors of the Gas Light and Coke Company. The report of this committee is in course of preparation. The council have awarded the Birmingham medal to Mr. Frederick Siemens, the originator of the regenerator system of furnance.

A great deal of interest will center round a matter that I am not in position to discuss fully, since no official intimation of it has been published. But it is no secret that a scheme, emanating from the council, has lately been submitted to the respective secretaries of the district Associations of Gas Managers, for the amalgamation or swallowing up of the latter by the Gas Institute. As only a few weeks have elapsed since this matter was mooted, it is scarcely possible that anything decisive can be done at the ensuing meeting. Indeed the whole thing looks like a "feeler" towards the District Associations. The idea seems to be that, on the receipt of a requisition from a certain district, signed by a sufficient number of members, a section shall be established in that district, having its own district secretary and other officers, and power to hold meetings; but, of course, subject to the control of the central council. Possibly attention has been attracted in this direction by the handy little volume, comprising the official reports of the whole of the District Association meetings held during the year 1883, which has been published by my friend, Mr. Walter King, the proprietor of the *Journal of Gas Lighting*, and which represents an amount of useful work for the profession that may worthily excite the envy of a council which aims at making the "Gas Institute" the representative of the gas industry in this country. As the matter now stands, however, it will be well to leave it until my next letter.

The Gaslight and Coke Company, which supplies the greater part of the city of London, have recently scored an important victory with regard to the steam roller nuisance. I do not know if you are troubled with steam rollers in America, but some of the people who have the making of our public thoroughfares here think a great deal of them. The steam roller is simply a large edition of the garden roller, with the addition of a boiler, coal tender, and driving machinery. The whole makes a passable resemblance of some "steam stokers" that have been proposed for our retort houses, and this ugly affair perambulates the thoroughfare in course of repair, at a slow pace of about a mile an hour, with a hissing of steam, clanking of machinery, and general hubbub that can be heard a quarter of a mile off. Some road surveyors argue that a machine of this kind weighing, when loaded, about 20 tons, is just the thing for making good cheap roads; while others consider that anything above 5 tons in weight does more harm than good, by crushing and breaking up the stones rather than compacting them together. The road surveyors of a certain district—the parish of St. Mary Abbotts—inclined to the former view, and accordingly purchased two rollers, one of 10 tons and the other 15 tons weight, and proceeded to perambulate the roads under their charge forthwith; not exactly to the satisfaction of the inhabitants, but to to the alleged saving of their money. As might naturally be expected, where the underpinning was weak, either from the nature of the soil, or on account of adjacent excavations, the gas pipes would not stand the strain, and fractures were of no uncommon occurrence. Official complaint of this being made by the Gas Light and Coke Company, the authorities replied "that the company must replace their pipes with stronger ones if necessary, as they intended to continue to roll." The gas company then applied to the High Court of Justice for an injunction to prevent the damage to their mains and services. After due hearing of the case, with the usual array of lawyers and experts on both sides, Mr. Justice Field delivered a judgment that was remarkable for a fair and just grasp of the whole subject at issue, as regards the rights of both parties; and granted and injunction restraining the road surveyors from using steam or other rollers in such a way as to cause fracture of the gas mains, also awarding nominal damages. Perhaps there will be an appeal against this verdict.

The various gas works in the Isle of Wight have been unfortunate lately. Although this popular pleasure resort does not boast of more than something under half a score, almost half that number of mishaps has occurred in connection with these undertakings within the last few years. The latest is the falling out of one of the walls of a coal store, supposed to be due to the pressure of the coal stacked inside; three men were buried beneath the ruins, two being killed whilst the third escaped without serious injury. About three months since a gasholder, 66 feet in diameter, and 22 feet high, was completely shattered; the holder appears to have been working rather loose in its guides, and the swaying caused by the wind led to the fracture of the supports of one of the guide rollers on the top. The holder then tilted up to such an extent that a portion of its bottom edge lodged on the tank wall, the gas escaped and the whole structure fell into the tank in a state of collapse. At one works the encroachments of the sea being deep, undermined the coal store, and the winter stock of coals went out to sea; in consequence of which the balance available for dividend was seriously interfered with. I am also told that a gasholder and tank has bodily shifted several inches.

The inhabitants of Chesterfield have had enough of the electric light, and have returned to gas. The lighting of this town was one of the earliest applications of the "Brush" light, and probably it has been the one most extensively advertised. Taking advantage of an unfortunate disagreement between the town authorities and the gas company, as to the terms of public lighting, the electrical people were able, principally by appealing to the vanity of the town councillors, as offering a medium for rendering themselves independent of the gas company, to obtain a strong footing in the town; and, in spite of repeated delays and failures, that sometimes reached such an extent as to render the street lighting of Chesterfield an object of ridicule, they held the contract for public lighting for several years. This year, when the time came round for the renewal of the lighting contract, the state of public feeling was very strongly in favor of a return to gas, and a deputation waited upon the Mayor to suggest a public meeting for the discussion of the question. Under these circumstances the gas company made an offer which was accepted by the town council, so the streets of Chesterfield will now be properly and efficiently lighted. While on the subject of street lighting, it is interesting to notice the great improvement that has taken place in the public gas lights of all, not only of the principal, but down even to small towns. Not so very many years since the whole of the public lights were supplied with common burners, using 4 to 6 cubic feet of gas per hour; if a larger amount of light was found to be desirable, at such situations as wide crossings in busy thoroughfares, and the various centers of traffic in our large towns, groups of three, five, or more ordinary lanterns and burners were used. These ugly and inefficient groups of ordinary lanterns are now replaced by the modern 100 or 200-candle burner; and in addition there are many principal streets lighted entirely by means of these large burners. The extent to which these burners, say from 50 to 200-candle power, are used, not for street lighting alone, but for the lighting of large spaces generally, and the increasing demand for them, are well worthy of remark, especially when we remember that it is only a few years ago since they were first introduced.

Petroleum Discoveries.—Reports of the discoveries of new petroleum oil centers are being constantly made; and among the most recent developments of this nature it is said that flowing wells have been located in Southern Texas. The German province of Pomerania is also spoken of as likely to prove a fruitful source of supply, a large well having been opened up at Swankow, near the Baltic Sea.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

A Curious Fact in Relation to the Krakatoa Upheaval.—Mr. L. P. Gratacap, of New York city, writes us to say that an item of news to gas men has been elicited in the course of a very extended examination of the facts and circumstances attending the disastrous eruption of Krakatoa, in Sunda Straits, last summer. The entire report of the affair has not yet been published; but the following paragraph, extracted from a letter of Mr. R. D. M. Verbeck to the Editor of *Nature*, to be found in volume 30, p. 12, is certain to possess matter of interest to the fraternity. Mr. Verbeck says:

"Finally, in the most violent explosions, air waves of an astonishing length were formed. As the Meteorological Institute at Batavia (capital of the island of Java) no longer possesses a self-registering barometer those waves would have passed unobserved at that point had they not fortunately been recorded by the pressure indicator of the gas works. This apparatus is self-registering, and continually marks on paper, wound round a revolving cylinder, the pressure of the gas. As the large gasometer was set in motion, on dates of August 26 and 27, by the pressure of the air-waves, these oscillations were marked by the indicator; consequently the line of pressure on these days shows, instead of the normal curves, a number of sharp points. As hour lines are marked on the paper, the precise time at which these oscillations occurred can be accurately fixed; and, if the time which the wave occupied in traveling from Krakatoa to Batavia be deducted, the moment is also known when the wave was formed and the explosion took place."

A Contract Secured.—Mr. William Gardner, of Pittsburgh, Pa., has been awarded the contract for remodeling and renewing 12 benches of retorts at the works under the control of the officials of the city of Richmond, Virginia.

Annual Meeting of the Stockholders of the Quincy (Ills.) Gas Light and Coke Company.—The annual meeting of the stockholders of the above named corporation was held on Tuesday, June 17. The annual report of the management disclosed a highly satisfactory condition of affairs. When the various financial matters connected with the meeting were disposed of an election for directors was had, and the following gentlemen chosen (over one-half of the stock being voted upon) to manage the affairs of the company for ensuing fiscal year: Messrs. C. M. Pomroy, William Steinwedell, H. R. Corley, A. W. Littleton, William Marsh, R. S. Benneson, H. S. Osborn, and Matthew Dick, of Quincy; and Alfred Carr, of St. Louis, Mo. At the subsequent meeting of the board the following organization was effected: President, Mr. C. M. Pomroy—taking the place of Mr. James D. Morgan. The latter gentleman has served the Quincy company for a period of 17 years in the presidential chair, and refused a re-election. Vice-President, Mr. William Steinwedell; Secretary, Mr. H. R. Corley; Superintendent, Mr. A. W. Littleton.

Price of Gas Reduced by the Wilkes-Barre (Pa.) Gas Light Company.—Mr. Marcus Smith, Secretary of the Wilkes-Barre (Pa.) Gas Light Company, by order of the Board of Directors, has given notice that from and after June 1 last, the gross price to be charged for gas consumed will be at the rate of $2 per 1,000 cubic feet. All bills paid on or before the 15th day of each month are to be subject to discount, scheduled as follows: Five per cent. off on accounts under $20; 10 per cent. on accounts over $20 and up to $50; 15 per cent. on all bills representing a monthly consumption of over $50 in value. This will be noted as a very liberal concession, the former rate having been $2.50 per thousand. The notification was first made public on date of June 18; but, as before stated, it really goes into effect from the first day of that month. Keep up the good work, Messrs. gas men.

Displeased with the "Mast" System.—The electric lighting people, with their usual "burning zeal" for the woes of a public suffering from the trouble of poorly lighted streets, applied to the city council of Victoria, British Columbia, for the privilege of turning the night into day in that locality. The wonderful system guaranteed to effect the revolution was neither more nor less than the erection of a specified number of mast arc lights. Dazzled with the promises of the gentlemen who were so anxious to relieve Victoria from its "benighted" condition, the Council granted the asked for consent, the masts were planted, the wires were strung, and the dynamos revolved. But, from the very start of the attempt at lighting service, the arrangement did not work smoothly, for the extinctions were frequent, and the temper of the inhabitants was sorely vexed. For quite a while the electric folks succeeded in quieting the disgusted taxpayers by saying that when certain unexpected difficulties met with had been eliminated the lighting would become all that was promised for it at the outset. Instead of matters being improved, the contrary result happened, and the crisis was reached about the middle of last month, when the Victoria councilmen gave formal notice to the electric lighting company "that the city lighting by the mast system must be speedily improved, or the existing contract would be summarily terminated." We are not positive of the exact date on which this notification was issued, nor are we sure of the time that was to be allowed for the improvement asked for to manifest itself before the contract would be broken. Our advices were received rather indirectly, having come by way of New Tacoma, Washington Territory; but understand the Council made the request on June 15 last, and that 48 hours grace was granted the electric lighting contractors in which to partially redeem themselves. From all of this it can readily be seen how night was not turned into day at far-away Victoria, and how like unto his New York brother is the British Columbia electrical promoter.

The Vicksburg (Miss.) Gas Light Company Heard from.—At a meeting of the directors of the Vicksburg Company, held at the office of the corporation on Wednesday June 11, a resolution was offered that the price of gas be reduced from $4 to $3 per 1,000 cubic feet. It is gratifying to announce that not a single objection was made to its passage, and furnishes good evidence that the Southern branch of the fraternity is disposed to follow in the line of progress.

Fifth Avenue, New York City, Left in Darkness.—The erratic course of the arc system of lighting received a pretty illustration on the night of June 23 last. The Brush Electric Light Company have their apparatus on that portion of Fifth avenue extending from Madison Square to Thirty-fifth street. On the night in question the lamps were set aglow at the usual hour, and everything appeared to be serene; but "a change came o'er the spirit of the scene," for in fifteen minutes after the "pale moons" first blazed up, every light on the circuit went out, and remained "out" for two hours and a-half. All the information vouchsafed to anxious inquirers was "that something was wrong with the wires leading from the uptown station." A *World* reporter, in conversing on the subject of the extinction with the superintendent of Delmonico's famous uptown restaurant, was told by the irate official that this thing had occurred before, and was getting to be a nuisance. He (the superintendent) thought that the residents of the streets and avenues where electric light had replaced gas lamps should petition the Gas Commission to put back the gas lamps so that they might be "fallen back upon" in case of the failure of the electric lights to do their proper work. The gas could then be turned on, and people would not be kept in darkness for hours at a time; and closed his remarks with asserting "that the expense of the gas could be charged to the offending electric light company." No doubt the offended superintendent had just cause for complaint, as the neighborhood of Delmonico's is rather a busy spot between the hours of 7 and 10 P.M.; but the remedy suggested seems to us as somewhat unfair. Why should the city gas light companies be compelled to make amends for the shortcomings of the Brush street lighting service, especially when a pursuance of the course suggested means a large addition to the possibilities of leakage to be charged off in the shape of unaccounted for gas. It is a well-known fact that the greater portion of losses charged to this account by our city gas companies is to be accredited to the street lamp service; and, if a supply of gas is to be laid on and maintained constantly, merely to be used when the electric extinctions occur, it is hard to see where the providers of such gas supply are to come in for anything like a fair share of remuneration. Rather at the narrow, than at the wide "end of the horn," we guess. Considering the prices paid for the bulk of the street gas lighting done in New York city at the present time it is hard to reconcile the action of the Gas Commission, in paying for the maintenance of so many arc lights, with correct ideas of economy and fairness. There can be no manner of doubt as to the fact that if a similar amount of money were expended on gas lighting in the districts now exclusively illuminated by the arc lamps the lighting service would be at least twice as good. To come back to Delmonico's superintendent. How would that astute gentleman view a proposition looking to his maintaining a set of reserve ranges and fires in his kitchen in order that he might extend the use of same to some brother caterer or hotel-keeper whose kitchen arrangements had ceased to be effective on some account or another, and then, as a recompense, be paid only for the fuel that was actually burned during the time that his unfortunate frater was in difficulties? Would the idea strike him as a good one?

Killed by the Electric Current.—A fatal accident happened at Bridgeport, Conn., on the afternoon of Friday, June 13, which appears to have been brought about in the following manner: A party of four youths, returning to their homes after witnessing a game of baseball, noticed a thick wire which had so far sagged from its original position as to be easily grasped. One of the party dared any of his companions to catch hold of it; a lad named Emil accepted the challenge, seizing it with a tight clutch. The wire so held was one of a circuit conveying a strong current of electricity to some arc lamps, and without a covering of any insulating material. The unfortunate experimenter was thrown to the ground, and appeared unable to throw the fatal wire from him. When released from its contact he was unconscious, and died shortly after being removed to his home.

Action Taken by Governor Cleveland in Regard to the Brooklyn Gas Bill.—Governor Grover Cleveland has refused to sign the bill, introduced into the Senate by Senator John C. Jacobs, and successfully carried through both branches of the Legislature, requiring the proprietors of future gas undertakings in Kings county (in which county is located the city of Brooklyn) to secure the signatures of a majority of the property-holders along the streets in which it was proposed to lay gas mains, before such installations could be made. The Governor has signed the bill prohibiting the further stringing of overhead wires, and requiring those already in place to be put underground within a certain specified time. This measure applies to cities containing a stated number of inhabitants, and is thought by some of the best legal talent in the country as likely to fall short of its purpose on account of unconstitutionality.

Gas Matters at Richmond, Va.—At a meeting of the Richmond (Va.) Common Council, held Wednesday, June 18, the members concurred unanimously in the action of the Board of Aldermen in voting an additional appropriation of $20,000 to be devoted to the enlargement and extension of the city gas works system of street mains, according to the suggestions advanced by the Board of Public Interests. It might be here stated that Messrs. Tanner & Delaney have been awarded the contract for furnishing the retort castings; and the same firm will also erect the new scrubber.

Naphtha Storage About Gas Works.—Naphtha is a very lively article, and the truth of the assertion is so apparent that no argument need be advanced in support of the statement. It is treacherous at all times and in all places; and notwithstanding the great care and vigilance exercised in its handling and storage at gas works where the material is used in the process of manufacture, damage and loss are frequently reported as having occurred. Several such cases have recently transpired, among which may be mentioned as samples the fire at the Mutual Company's works in New York City; at the Utica (N. Y.) works; and at Bloomington, Ill.—the latter involving a loss of about $20,000, and being the second time, within a comparatively short period, that damage had arisen from the same cause. The Bloomington disaster has attracted the attention of a correspondent, whose communication on the subject will be found in our correspondence column of the present issue. Besides the cases enumerated above, comparatively slight accidents are really of frequent occurrence; and if, fortunately, the losses have been trifling, their very happening serves but to emphasize the possibilities of ever present danger.

Springfield (Ill.) Congratulates Itself.—While upon the subject of naphtha danger, our readers will probably recall to mind that the old Bloomington (Ill.) works were gotten control of by a syndicate the chief spirits of which were Messrs. Mast, Foos & Co., of Springfield, Ohio, as a natural sequence to the opposition movement started there quite a while ago. The same syndicate then endeavored to obtain an opposition charter for the town of Springfield, Illinois; but, owing to a wise move on the part of the management of the old Springfield Company, in making certain concessions to the authorities of that place in the matter of price, service, etc., the scheme fell through. The Springfield *State Register* was a consistent opponent of the opposition scheme, and took a firm stand in regard to the foolishness of the policy of letting any set of speculators have the right to attempt to divide the business of the established company, and especially did it object to such a course since the existing company was willing to do everything that could be considered reasonable and right. The much-vaunted advantages of the new process under which the applicants proposed to work were subjected to criticism, and, naturally enough, the *Register* is now disposed to call attention to the troubles recently experienced at Bloomington. After giving an account of how the Bloomington explosion and conflagration occurred, the *Register* goes on to say:

"Bloomington has had an unenviable experience with its naphtha gas. This is the second fire that has taken place there within a few months; and the company operating the works has a monopoly and is receiving much higher prices than those now charged at Springfield.

"The manufacture of gas from naphtha and water is in its infancy, and, in its present stage of development, an experiment that does not commend itself to the best judgment of impartial investigators, however profitable it may be to the holders of patents. It was mainly for this reason that the *Register* was not an advocate of the introduction of the experiment into Springfield, provided we could make satisfactory terms with the old company for our gas supply. As this has been done to the satisfaction of the most exacting, and as our supply is ample, there is no reason why our streets should be torn up and our newly-laid pavements seriously injured merely to introduce an experiment that is dangerous to life and property. It may be that in no distant future discoveries will be made that will remove the objections that now exist leading to danger from fire and explosion in the manufacture of this gas. If this be so, it will then be time enough to consider its introduction into Springfield. This city is certainly doing well enough, and the *Register* believes in letting well enough alone."

Change Your Oil Stoves.—The Youngstown (Ohio) Gas Light Company has adopted a similar practice to that instituted by the Indianapolis Company, the particulars of which were given in our item columns of last issue. The Youngstown folks offer to change any gasoline stove into a gas cooker, charging for the operation the sum of $1 per burner, which price also includes the necessary pipe connections. They have taken a good way of making this known to the housewives of the city—the method consisting of publishing a handsomely displayed large sized advertisement in the daily papers of the city. Literally speaking, the notice may be read while running.

Cheaper Gas for the Twenty-Fourth Ward, New York City.—The Northern Gas Light Company, whose field of operation is in that portion of the city known as the Twenty-fourth Ward, is now selling gas at the rate of $2.50 per thousand. We hope to be called upon to put on record an account of how the New York city companies proper have reduced the selling prices. Judging from all the stray rumors floating around the metropolis, the dwellers therein are soon to see inaugurated an era of cheap gas; and the best of the thing is, there won't be any gas war either. It is not a hazardous statement to make to say that if the price of gas were reduced to $1.75 per thousand the gas companies of this city would find it difficult to make their send-out keep pace with the demands of consumption. Speaking on the subject of increasing send-out taxing the resources of the plant, one of the most original methods we ever heard proposed of remedying such trouble was given by the president of a gas company in the interior part of this State. The superintendent of the works said to the wideawake (?) president, "Mr. X., if the people of our town keep on increasing their gas consumption at the rate which has obtained during the last two years, it will be necessary for us to greatly enlarge our manufacturing facilities." After some cogitation, during which our worthy officer displayed many symptoms of mental agitation, he delivered the following: "Well, Mr. ——, that is rather disquieting news. Suppose we increase the selling price; do you think such a course would let us out of our difficulty?" Let him out of his difficulty! We guess so; that gas works retort house ought to be a good place, after the lapse of a year or two, for the searcher after fine specimens of moss.

Elgin's Towers Once More.—The Elgin *Every Saturday* thus refers to that city's electric lighting system—or, more properly speaking, to the lack of light supposed to be furnished by the "ten thousand candle lights" roosting on the tower tops:

"By day Elgin is lighted by the same sun that Joshua commanded to halt—in the early days; and by night the darkness is made visible by a few lanterns high up in the heavenly space, casting ghostly lights and shadows, in the proportion of fifteen shadows to one light."

Nothing unusual in that proportion; it is the one generally noticeable in most localities.

Mr. Faben to Sever His Connection with the Milwaukee (Wis.) Gas Company.—Mr. Charles R. Faben, for the past seven years in charge of the engineering department of the Milwaukee Gas Company, will retire from that position on the 1st of next month. During his connection with this company Mr. Faben has planned and carried out a system of improvements and additions that has made the Milwaukee plant second to none in the country, so far as efficient working is concerned. He will, on that date, remove to his old home at Toledo, Ohio.

Alleged Over Issue of Gas Stock.—Matthew J. O'Rourke, of No. 190 Washington avenue, Brooklyn, N. Y., once known in connection with the doings of the Tweed Ring, appeared before Justice Smith, at the Jefferson Market Police Court, in this city, and accused Ex-Alderman and Ex-Health Commissioner Magnus Gross, of No. 340 East 86th street, of having, between dates of October 24, 1882, and February 17, 1883, issued unlawfully and sold to Richard D. Perry, of New Brighton, Staten Island, 800 shares of the stock of the Excelsior Gas Light Company, of which corporation Mr. Gross is the President. It was claimed for the plaintiff that the directors of the company never authorized the issuance of the stock specified. Mr. Gross denied the allegations, and asked for a speedy trial of the case. When the result is reached we shall record the decision. In the meanwhile parties who are informed as to the merits of the dispute say that there is nothing at all in O'Rourke's charges.

They Can Make Gas but May Not Distribute it.—The Court of Appeals of the State of Missouri has promulgated an opinion in the case of the St. Louis Gas Light Company vs. the St. Louis Gas, Fuel, and Power Company. This case was appealed from a lower court, and the original cause of

the action sprang from the granting of an injunction prayed for by complainant, who asked that the Power Company be restrained from manufacturing and distributing illuminating gas in that portion of the city of St. Louis lighted by the petitioner, alleging as cause why the injunction should issue that the State had guaranteed the petitioner sole possession of the disputed territory until a certain fixed date, which date had not yet been reached. Petitioner also gave as a further cause for allowance of the restraining measure that defendant's charter did not allow it to distribute illuminating gas through underground conduits, since these conduits were primarily buried for conveying steam for power and heating purposes. The decision just rendered by the court of last resort says in brief that the injunction originally granted was too broad in its terms. The Court holds that anybody can make and vend gas—so far being a victory for the Fuel Company; but the victory is turned into defeat, as, in another part of the opinion, it is affirmed that the Fuel and Power Company has no right to use the streets to lay pipes, and no right even to use the pipes already laid down, as conduits for the supply of illuminating gas. This the local papers aptly term "a victory, with spoils to the vanquished."

Lighting the French Railway Systems.—A good many of the railroad lines of France still adhere to the plan of lighting the coaches with oil; but the Pintsch system is rapidly gaining headway there.

A New Gas Company.—Beatrice, Nebraska, is to erect a gas works.

This Accounts for it.—Something seemed to weigh upon the mind of Mr. George G. Ramsdell, of Vincennes, Ind., while in attendance at the late meeting of the Western Gas Association. Various reasons were advanced in explanation of his preoccupation, but the following appears to show that the boys were on the "wrong scent." On a certain day early last month Mr. R. informed his friends that he was going to visit Chicago, and might possibly take a trip to the East on a visit of importance. A visit of importance! Ramsdell always tells the truth. The visit was of such moment, and charged with such gravity, that he telegraphed back to Vincennes (the telegrapher dating the despatch-blank as coming from Pittsburgh, Pa.) no less news than his union in marriage with Mrs. Mollie C. Hayes, a charming resident of Vincennes. It was rather rough on G. G. R.'s part to go all the way to Pittsburgh to have the knot tied; but, then, he is so bashful (?)—how could he stay at home. "Leaf by leaf the roses fall." Not long ago it was Littleton; now it is Ramsdell; and who is to be next? May Mr. and Mrs. R. always have the very best of good luck.

Destruction of the Bloomington (Ill.) Gas Works.

Owing to the kindness of a correspondent we are enabled to present the following details in regard to the conflagration at the works of the Bloomington (Ill.) Gas Light Company. The account is taken from the columns of the Bloomington *Daily Pantagraph*, of date of Wednesday, June 18.

"Just after the town clock last night struck the hour of midnight fire was discovered in the works of the new gas company, situated just northwest of the Union Railroad Depot, and for a time it looked as if the entire works would be totally destroyed. The fire department responded immediately, but, as they expected, they found the water supply wholly inadequate, and the mammoth and valuable works were almost at the mercy of the flames. They were obliged to take water from a four-inch main which runs from Center street, and is tapped in a great many places. They put on two lines of hose, but were unable to get more than a fifteen-foot stream. They then gave up one line of hose, and by connecting the engine with the mains they got one respectable stream of water.

"The fire originated in the basement of the works, but just how is a question. It had gotten considerably under headway before the engineer discovered it, and soon afterwards the flames took possession of the main building and began to feed upon it, burning, cracking, melting and curling the slate roof and the heavy iron rafters, and nearly the whole top section of the main structure fell in.

"Some of the attaches of the fire department had narrow escapes from death. Two of the firemen, named Meyers and Doyle, were badly burned. These men had entered the building, carrying a hose with them; when they had reached within a short distance of the generators, one of the vessels, containing about a barrel of naphtha, exploded with great force. Meyers was thrown down by the shock, and both he and his companion were badly burned.

"Fortunately, Mr. H. D. Spencer, one of the company's attorneys, was awakened by the fire alarm bells, and hastened to the works. To this circumstance is attributed the fact that, from his intimate knowledge of the position of everything around the plant, the naphtha storage magazine was, through great effort, prevented from exploding. The roof, doors, and windows of the main building, and portions of the north and west wings, were destroyed, as was also the entire system of generating apparatus.

"The damage done is variously estimated; but the buildings are fully insured.

"It will take from ten days to two weeks to place the works in repair, but the people will not suffer from want of gas, except that they will have to be contented with the old gas for this time. While the new works were burning the old Gridley plant was fired up, and from this source the necessary supplies will be sent out until the burned-out works are renewed."

Text of the Bill Requiring the Burial of Electric Wires.

The following are the provisions of the measure doing away with overhead electric wires in cities in the State of New York possessing a population greater than 500,000 souls—

Sec. 1. All telegraph, telephonic, and electric light wires and cables used in any incorporated city of this State, having a population of 500,000 or over, shall hereafter be placed under the surface of the streets, lanes, and avenues of said cities.

Sec. 2. Every corporation, association, or person owning or controlling telegraph, telephonic, electric, or other wires and cables, including what is known as telegraph poles, and other appurtenances thereto, shall, before the first day of November, 1885, have the same removed from the surface of all streets or avenues in every such city of this State.

Sec. 3. In case the owners of the property above enumerated shall fail to comply with the provisions of this act within the time herein specified and limited, the local governments of said cities of this State shall then, and they are here hereby directed to, remove, without delay, all telegraph, electric light, and such other wires, cables, and poles, wherever found above ground, within the corporate limits of their respective cities.

Sec. 4. No city in this State shall grant any exclusive privilege or franchise under this act to any corporation or individual by which a monopoly may be created or competition prevented on equal terms.

Sec. 5. This act will take effect immediately.

Experiments in Lighthouse Illumination.

The London *Times* furnishes the following relative to the experimental tests now being carried on, under the auspices of the English Government, at the South Foreland lighthouses:

It is worthy of note that the South Foreland lighthouses, which were originally illuminated by means of coal fires, were the first in which electricity—carbon in a more refined and more highly intensified form—was adopted as an illuminant. This was in 1857, when Professor Holmes first submitted his system of lighthouse illumination by electricity to the Trinity House. He received permission to establish his apparatus in the high light, the system being afterward extended to the low light. England was thus the first to adopt electricity for lighthouse illumination. The machinery and apparatus used for these two lights consists of four of Professor Holmes's magneto-electric machines—two for the high and two for the low light—which are both powerful and safe; producing a low-tension current not exceeding 60 volts. They are, moreover, very reliable; costing little or nothing for repair. There are two horizontal steam engines of the single cylinder type, each of 10-horse power nominal, but capable of developing 30-horse power each. Steam is supplied from a Cornish boiler, 15 feet long and 6 feet in diameter, and of which there are two, one being kept in reserve, as is also one of the engines, a single engine sufficing to drive the four Holmes machines and those used in the experiments to which we will presently refer. And here we may mention that upon our recent visit we found a very important permanent addition was being made to the South Foreland establishment. This consists of a long one-storied brick building which is being erected by the Trinity Board for the purpose of conducting photometric experiments with very powerful lights, for which at present there exist no adequate means. This shed is 380 feet in length, and it will be fitted with the necessary appliances for light testing; and there in future all the large lights will be tested.

In connection with the experiments three temporary wooden towers have been constructed in a line landwards, and bearing northwest from the permanent high light. These towers are marked A, B, and C; and are respectively used for the electric, the gas, and the oil light. Tower A is 245 feet from the high light; tower B 180 feet from A; and tower C the same distance from B. The focal plane of all the towers is 15 feet below that of the electric high light, which is 380 feet above the sea level.

In the electric arrangements Baron De Meritens arc lamps and magneto-electric machines are employed. At present there are two of these lamps and two of the machines in place, but another of each is to be added. The lamps are placed one above the other (or superposed) in the tower. The carbons used in them are compound—that is, they are made up of a number of small carbon rods of square section. The carbons in use at the time of our visit were 1¼ inches square, and were composed of 49 small square rods; but since then the new Berlin code carbons of Messrs. Siemens have been employed. The two machines for producing the current are placed in the

engine house with the others, and, as we have stated, are driven by the same engine as the Holmes machines. Each of the De Meritens machines is arranged for working at 1-5th, 2-5ths, 3-5ths, and at full power; the estimated intensity of the light from each machine at these powers being respectively 6,000, 12,000, 18,000, and 30,000 candles. The machines can either be worked singly or coupled up. Like the Holmes machines, those of De Meritens produce a low-tension current. They are found to be very reliable in operation, and inexpensive in maintenance.

The arrangements for illuminating tower B consist of a small gas works erected by Mr. J. R. Wigham, of Dublin, whose burners are used in the tower, his system having been adopted for lighthouses on the Irish coast. The gas works are put up and the gas illumination is now being carried out under Mr. Wigham's supervision. The gas producing apparatus consists of a small retort house fitted with two benches of three retorts; the necessary purifiers; and a holder capable of containing 4,500 cubic feet of gas. The gas is passed through a meter placed outside the tower to the burners within it, and which are four in number. Each burner is composed of a series of concentric rings of jets, and the light can be started with a minimum of 20 jets up to 108 jets—the full power of each burner, at which it develops 3,000 candle power. There are four of these burners superposed, and they can be used either singly or together—the lights being designated uniform, biform, triform, and quadriform, according to the number of burners in use at the same time. The object of the variations in power of the lights in all cases is to meet the varying requirements of the atmosphere.

In tower C oil lights are used, and these are produced by means of burners of the recognized Trinity House pattern. For this purpose nothing further is necessary than a tank outside the tower containing a store of Scotch paraffin, and the lamps and burners in the tower. The oil is supplied to the burner from the lamp, under slight pressure, by means of an arrangement similar to that adopted in obtaining hydraulic power; oil, of course, taking the place of water. The burners at present in use have six concentric wicks; each burner developing 720-candle power. But Sir James Douglass is preparing another burner of much higher power, having seven wicks, which will shortly be tried. The burners are arranged in three stages, and either a uniform, a biform, or a triform light can be exhibited as required. The burners are in duplicate on each stage, and by an ingenious arrangement the first lamp can be shunted out of position if necessary, and the second one lighted and shunted into its place without any appreciable loss of time. Sir James Douglass has also devised a very simple but effective arrangement for ventilating lighthouses, by means of which the heated air is rapidly carried off, but the atmosphere of the lighthouse is kept perfectly steady to a very high elevation in the coned roof, as was shown by experiments in this tower.

Such are the arrangements for producing the various lights. For testing them carefully elaborated arrangements have been made. An overland route has been laid down as a line of observation for a distance of 2½ miles from the towers in the direction of Deal, and stakes have been driven at every 100 feet. At half a mile from the towers on this route is hut No. 1 for taking photometric observations; and this is more particularly intended for fog work. At 1¼ miles we come upon hut No. 2, which is likewise fitted with photometric apparatus. At the limit of the range is a third hut; each hut being conveniently fitted up for the residence of the official in charge. Arrangements have also been made for observations to be taken at the various coastguard stations within the focal area, at Ramsgate and other contiguous places, and at various points out at sea, including the Gull and Varne light vessels, which are respectively 8 miles N.E. and 12 miles S.W. distant from the South Foreland. The observers are supplied with books for recording their observations in tabular form; and these will ultimately be collected and their contents collated for the information of the committee. The books contain directions as to the method of procedure in making observations. Observers are also provided with charts for land and sea observations, showing the illuminated areas to the north and south of the South Foreland. The committee have their quarters at St. Margaret's, contiguous to the experimental towers, where one of their body will always be in residence.

Ranging over so wide an area as they will, and involving so many investigations as they do, we need hardly say that the experiments will occupy several months, probably five or six. Every illuminant and variety of burner adapted for lighthouse illumination will be tested under every possible condition pertaining to itself and to the atmosphere. The most important point as regards atmospheric condition will be fogs, which will have very careful consideration. Upon the occasion of our recent visit splendid lights of varying intensities were produced at night by each of the three systems under trial. The experiments have at first been confined to the testing of apparatus and contrivances already in use. A further stage will be devoted to any other burners and appliances which shall be submitted to the committee, and after inspection by them shall be adjudged suitable for lighthouse illumination. It is thus open to the whole world to assist in promoting a movement of the first importance, which in its results cannot fail to prove of the highest value to every maritime nation.

Dangers of Natural Gas.

A recent issue of the *Iron Age*, in editorially calling attention to this subject, says:

Of the great benefit that natural gas promises to be to the manufacturers of Pittsburgh there are no two opinions. It is a purer fuel than coal; is already in the form of gas, and consequently requires none of its own heat-units to convert itself into gas, as coal does; it requires no stoking or feeding, and consequent raising and lowering of the temperature, while its flow and the amount used can be easily regulated and waste prevented. As a consequence of all this, in the manufacturing of iron or raising of steam, or, indeed, in any of the uses to which it is put in competition with coal, the results obtained are very much better with gas than with coal, and if, as seems now probable as the effect of the Westinghouse well, a large supply of gas is secured near Pittsburgh, the manufacturers of that city may congratulate themselves upon this new evidence that Pittsburgh is, all things considered, the most highly-favored manufacturing center in the world.

But there is always a fly in the ointment, and the one in this is the danger anticipated from its use. It comes to the surface, as a rule, under very high pressure, and in conveying it through the streets or factories there is constant danger from imperfect work upon the conduits of leakage or bursting of the pipes. When leakage occurs it is difficult to detect it by reason of the gas being nearly or quite inodorous. When mixed in the proportion of one volume of gas to from 9 to 12 volumes of air the mixture is very explosive, and it is evident that there must be great danger from its use. In a number of instances already quite serious explosions have occurred at some of the Pittsburgh iron works, arising from leakage while in other cases through the ignorance of the party using it, explosions have taken place under boilers, the firemen turning on the gas and lighting it afterward, instead of throwing an ignited substance in the fire-grate before turning on the gas.

The underwriters of the city of Pittsburgh have been examining, through a committee, into this subject, and have come to the conclusion that none other than low-pressure service for the conduits and distribution of gas should be recognized, and they are calling upon the public authorities to use such restrictions as will afford ample protection to life and property. In rather a guarded manner they state that they have had submitted to them by responsible parties plans and specifications for the conduits and distribution of gas at low pressure, which seem to them both feasible and practicable. While it is well to thus rise the danger signal, it is certain that some method will be found to reduce the risk of accidents to a very small minimum. Such a valuable product must be used, and there certainly is knowledge enough or to be gained to guard against the liability to accidents and to make such accidents practically impossible.

Correspondence

[The JOURNAL is not responsible for the opinions expressed by correspondents.]

The "Line" Shrinks.

PHILADELPHIA, PA., June 19, 1884.

To the Editor AMERICAN GAS LIGHT JOURNAL:

About two months ago the following paragraphs appeared in one of our papers:

"Bloomington, Ill., has said a tender farewell to coal gas. The new Citizen's Gas Light and Heating Company has leased the works of the old coal company for a term for twenty years, and these latter works are now closed up, while the Citizens' Company is furnishing a good candle power Lowe gas to consumers at less than the rates paid the old company before the lease was effected.

"We congratulate the citizens of Bloomington that their city has taken its place in the long line that is steadily growing longer, and that never, even temporarily, loses any of its length."

Apparently there are a great many "kinks" in this never-ending line, and we notice that the congratulated Bloomingtonians have themselves just furnished one in this wise:

"BLOOMINGTON, ILLS., June 18.—About 12.30 this morning the new gas works were in flames for the *second time*, the fire originating in an explosion of a naphtha tank. Loss, $20,000. The city was in darkness."

Though the citizens may not relish the method, they certainly cannot accuse the new company of niggardliness in its occasional extra-illuminations.

When we hear that this wonderful "line" never, "never, even temporarily" loses any of its length, we are forced to cry, "belay." We know, too, that there are a great many weak strands in it, and that sometimes it has actually parted. It will, no doubt, greatly surprise many of your readers to learn that a gas light company of this State has changed its process back from oil to coal. And, still more wonderful to relate, the change was made because they saw coal gas would be cheaper. That is at Bristol, Pa. Originally they made coal gas; then changed to oil gas, and now have returned to the "old fashioned" plant. We say the change seems wonderful, because we have heard that oil gas can be made anywhere for about one-half the cost of coal gas. Many managers of small plants are much interested in such cases; and, no doubt, they would like to know how the wideawake Bristol people managed it.

A.

THE AMERICAN GAS LIGHT JOURNAL

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AGENTS

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BOSTON—S. M. PETTENGILL & Co., 6 State Street.
PHILADELPHIA—PRATT & Co., Corner 9th and Arch Streets.
England—C. W. HASTINGS, 22 Buckingham St., London, W. C.
Germany—B. WESTERMANN & Co., of New York

WEDNESDAY, JULY 2, 1884.

NEW PIPE LINE.—A charter has been granted to the Independent pipe line, which is to run from the Connoquenessing creek, in Butler county, Pa., to a point at or near the town of Butler, and to be used for the storage and shipment of petroleum. Capital stock is placed at $20,000.

The Market for Gas Securities.

The closing of the first month of summer shows a satisfactory condition of affairs prevailing in the market for city gas shares. Holders appear to be well satisfied with the solidity of the character of their gas share investments, and do not seem to evince any special symptoms of uneasiness regarding the future of this particular department of business enterprise, notwithstanding the depressed condition of financial matters in Wall street. The assignment of Commodore C. K. Garrison, made a few days ago, caused some speculation as to whether he had all along retained the major part of his gas stock holdings. Mr. Garrison undoubtedly was at one time the largest single holder of gas securities (both stocks and bonds) in the United States; but it appears that, for some two or three years past, he had gradually parted with them. The New York *Tribune* states that Mr. Garrison had become financially entangled in connection with the Wheeling and Lake Erie Railroad, and the Pittsburgh, Cleveland, and Toledo Railroad. To raise funds wherewith to carry on these operations he sold outright a portion of his gas stock holdings, and pledged the balance as security for loans. At any rate, Mr. Garrison's assignment had no bad effect upon the gas share market, and the prevailing situation may be summed up in the statement that city shares are dull and strong. We would recommend to those of our readers who are desirous of noting just how strong the present ruling rates are, to turn back to the market report for July 2d of last year (Volume XXXIX., page 13.) For such as do not care to take that trouble, we will here give the quotations for highest and lowest-priced New York city shares (of course, only the six leading ones being considered) as then recorded. These we find to be—Manhattan, bid 232, offered at 235; Harlem, bid 101, offered at 103. Compare these figures with those given below, and the whole situation is made plain.

In out-of-town shares, a considerable improvement is noted in the case of San Francisco Gas Light Company's shares.

Gas Stocks.

Quotations by Geo. W. Close, Broker and Dealer in Gas Stocks (with W. B. SCOTT & CO.,)
34 PINE STREET, NEW YORK CITY.
JULY 2.

☞ All communications will receive particular attention.
☞ The following quotations are based on the par value of $100 per share.

	Capital.	Par.	Bid	Asked
Central	$466,000	50	36	70
Equitable	2,000,000	100	90	3½
Harlem	1,800,000	50	121	124
" Bonds	170,000		—	—
Manhattan	4,000,000	50	285	290
Metropolitan	2,500,000	100	230	235
" Bonds	658,000	—	107	110
Mutual	3,500,000	100	128	130
" Bonds	1,500,000	1000	104	106
Municipal	3,000,000	100	200	205
" Bonds	750,000		107	110
New York	4,000,000	100	150	154
Northern	125,000	50	—	80
" Scrip	108,000			
Gas Co's of Brooklyn.				
Brooklyn	2,000,000	25	128	130
Citizens	1,200,000	20	87	90
" S. F. Bonds	320,000	1000	106	110
Fulton Municipal	3,000,000	100	130	135
" Bonds	300,000		104	108
Peoples	1,000,000	10	72	75
" Bonds	290,000	—	105	110
" "	250,000	—	90	95
Metropolitan	1,000,000	100	90	92
Nassau	1,000,000	25	100	103
" Ctfs	700,000	1000	85	90
Williamsburgh	1,000,000	50	115	120
" Bonds	1,000,000	—	104	108
Richmond Co., S. I.	300,000	50	—	75
" Bonds	40,000	—	—	—
Out of Town Gas Companies.				
Buffalo Mutual, N. Y.	750,000	100	80	85
" Bonds	200,000	1000	95	100
Citizens, Newark	918,000	50	101	104
" " Bonds	124,000	—	105	10
Chicago Gas Co., Ills			150	155
Cincinnati G. & C. Co.			187	190
Consolidated, Balt.			51	51¼
" Bonds			113½	114
Central, S. F., Cal.			59	60
Capital, Sacramento, Cal.			58½	60
Hartford, Conn	750,000	25	120	125
Jersey City	750,000	20	150	155
Laclede, St. Louis, Mo.	1,600,000	100	98	—
Louisville, Ky	1,500,000	50	122	130
Montreal, Canada	2,000,000	100	186	187
New Haven, Conn		25	164	168
Oakland, Cal			29	30
Peoples, Jersey City		—	—	75
" " Bonds			—	—
Paterson, N. J.		25	96	99
Rochester, N. Y.		50	70	80
Washington, D. C.	2,000,000	20	190	200
Wilmington, Del.		50	174	—
Yonkers		50	33	35
St. Louis, Missouri	600,000	50	255	256
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San Francisco, Cal.			53	54

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The advertiser, aged 33 years, desires a situation in a Gas Works or Engineer's Office. Has had 12 years' practical experience in works in England. Well up in construction of works, manufacture, and distribution. First-class draughtsman. Can test gas for illuminating power, and understands the manufacture of sulphate of ammonia. Testimonials and references on application. Would commence at a reasonable salary. Address

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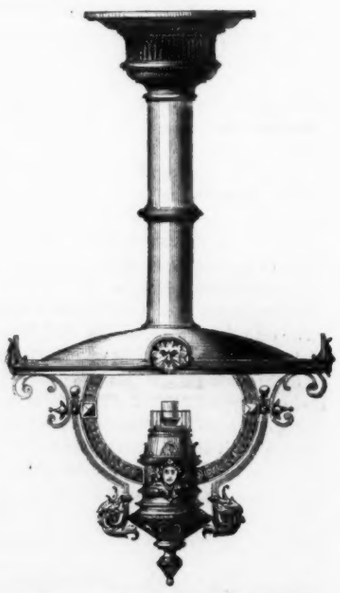

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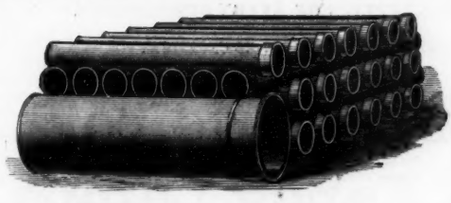

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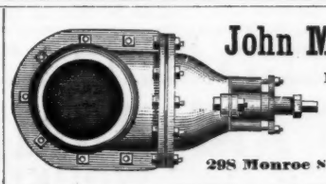

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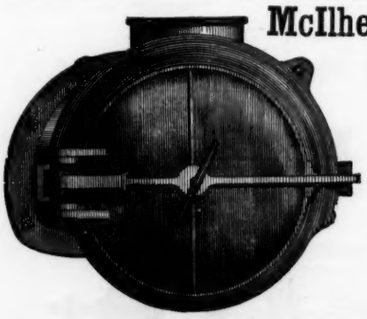

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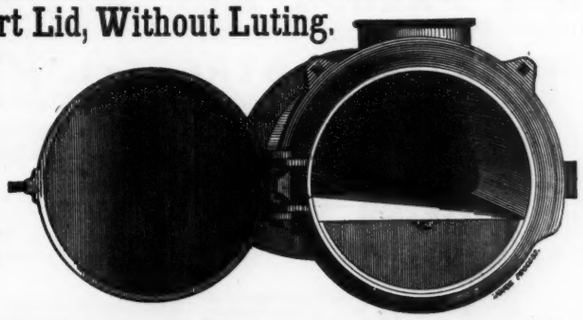

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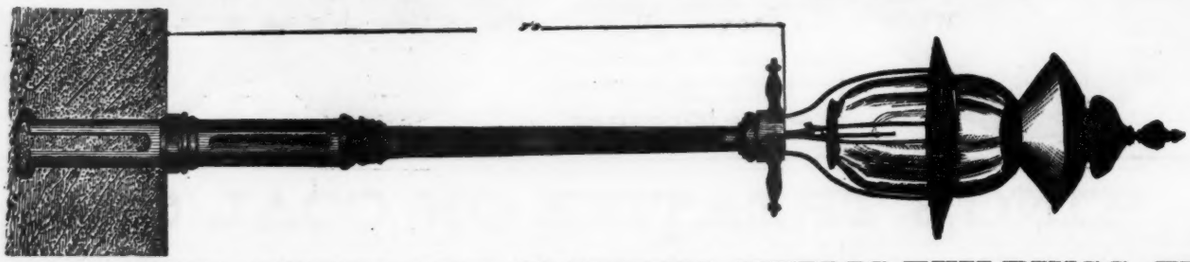

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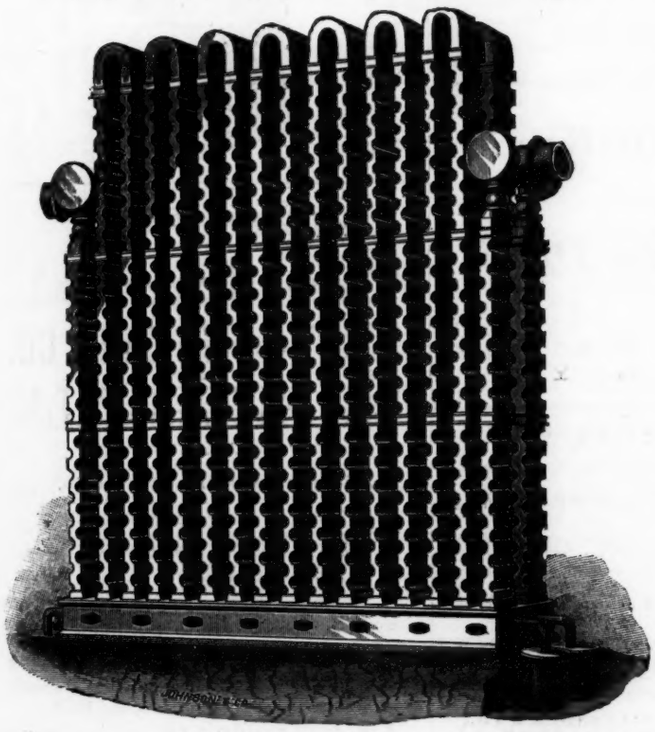

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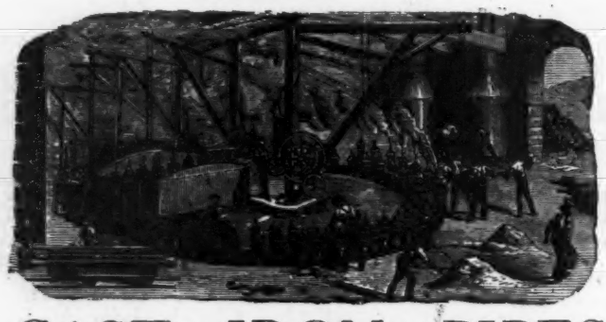

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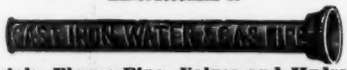

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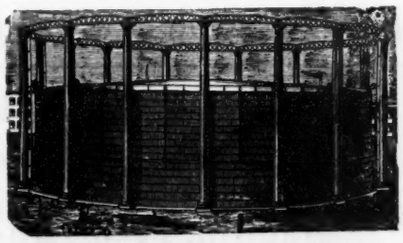

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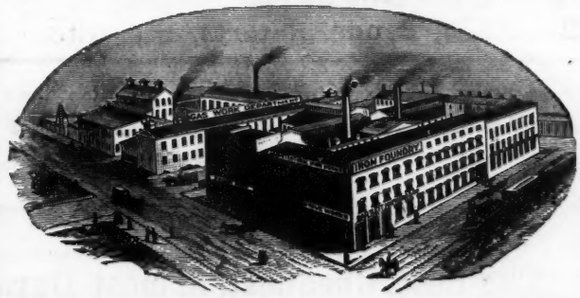

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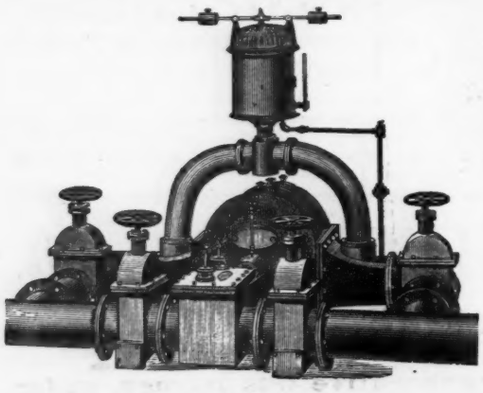

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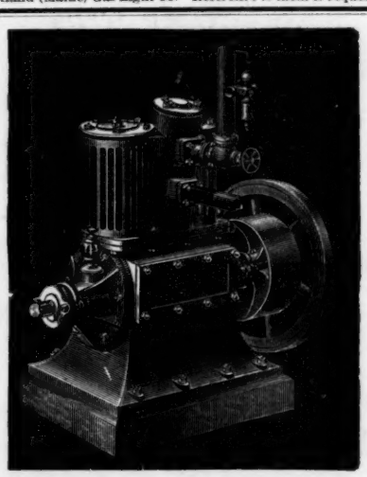

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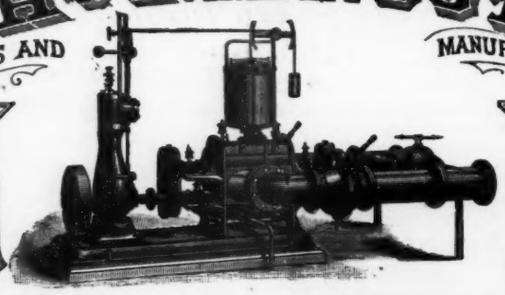

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It will be to the advantage of Gas Companies to supply their Consumers with one of these Guides, as a means of preventing complaint arising from their want of knowledge in regard to the registration of their meters For sale by

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49 Pine St., New York.

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